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INCORPORATING

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TO CALLERS AND TELEPHONERS

Until further notice our office hours are: Mondays to Fridays, 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Lords Debate on Iron and Steel

DURING the two-day debate in the House of Lords last week on the Government's plans for the nationalisation of the iron and steel industry, a number of peers, who are also prominent industrialists, gave grave warnings of the serious harm that would be done to the country if the Government carried out its projected scheme. Lord Greenwood, Chairman of Dorman Long & Co. Ltd. and a Past-President of the Iron & Steel Federation, said he would rather borrow money at 4 per cent. than be in bondage to any Government, and he was sure that the industry would rather go to the market for its money than be subsidised by the Chancellor of the Exchequer. He argued that the steel industry report and plan had been agreed by the whole industry, and that there was no one capable outside it of preparing an alternative scheme because of the severe technical difficulties inherent in the industry. The Government's suggestions were vague and would make for delay, and in business these were two major sins. He said, too, that in the steel trade it was believed that in a few years there would be a slump, and every preparation had been made in the industry's plan to make that slump as harmless as possible.

Steel Export Trade Difficulties

In Lord Greenwood's view the time would come when it would be difficult to sell steel, and he asked how, under nationalisation of the industry, a salesman could sell it in places like Egypt or India, where, however unfairly, prejudices were running so strongly against the Government. Another factor affecting steel exports under a nationalised scheme was mentioned by Mr. A. S. Stewart, Chairman of Stewarts and Lloyds Limited, at the recent annual meeting of the company. He also was strongly critical of the proposed nationalisation plan, and said it would be a great disservice to the country if, as the result of it, the goodwill and name of Stewarts and Lloyds were to be lost to the country's export trade. The loss of the goodwill associated with the names of industrial undertakings is not the least of the arguments against nationalisation. In many cases this goodwill is of great value and has been built up over long years at considerable cost. The effects of the loss of goodwill attaching to a name in overseas markets have been experienced in the past, as a result of amalgamations of undertakings, but never on the scale that would be involved in the case of the wholesale nationalisation of fundamental parts of an entire industry.

Railway Carriage and Wagon Employment

The steady rise which has been in evidence for some time in the numbers employed in the construction and repair of railway carriages and wagons, continues. It is marked by an increasing percentage of male labour, as releases from the Services and from other wartime occupations enable manufacturers to recruit more men, and as women workers move out of industry. There is still a shortage in the most skilled types of labour, but recently issued statistics show that at the end of the first quarter of this year there were 71,000 employees in the industry, as compared with 68,000 at the end of 1945, and 61,200 in mid-1944. Of the present labour force 64,200 are men and only 6,800 women, which compares with 60,000 men and 8,000 women at the end of last year, and with 51,200 men and 10,000 women in June, 1944. Total employment in the industry is now being maintained at a very high level. In June, 1939, the workers numbered 65,600, of which 62,300 were men and only 3,300 were women. A low point was reached in June, 1943, when the numbers engaged were 59,100, of which 49,500 were men and 9,600 were women.

Argentine Railway Recovery

Last week there was a growing demand on the London Stock Exchange for the issues of the British-owned Argentine railway companies. The advance in prices was based on hopes of an early resumption of Anglo-Argentine talks on the future of the railways, and also the reported statement by President Peron that foreign undertakings would be respected by the new regime in Argentina. There was also talk of a

rise in the peso-sterling rate, which would benefit the companies by the elimination or reduction of the exchange losses from which they have suffered heavily for a number of years. A still further factor making for better sentiment was the belief that the fuel position of the railways was now easier. So far, there has been no official indication that talks between the British-owned railway administrations and the new Argentine Government are about to be resumed, but obviously in view of the early expiration of the Mitre Law it is reasonable to suppose that discussions will be undertaken with the new administration as soon as practicable. *The Financial Times* on Monday last stated that an important British mission is to leave shortly for Argentina to discuss the future of the railways.

L.N.E.R. Passenger Department Research Section

The L.N.E.R. has been considering a wider application of modern office methods to accounting procedure and to the many other operations carried out in passenger booking and parcel offices, and, in particular, the possibilities of further mechanisation. An experimental booking office similar to that at Welwyn Garden City is to be established at Bowes Park. To centralise this experimental work the company has set up a Passenger Department Research Section under the control of the three Area Passenger Managers. The section will be located in London, but investigators will be stationed in each of the three areas to collate facts and report on local conditions in relation to improved methods of working. The new research section will not undertake work which is being carried out efficiently by the Engineer's Department and in the works sections of the Traffic Departments, but it will focus inquiries on the use of new methods, collaborating with the sections and departments concerned with the question of new works and their design. Particular attention will be given to means of educating and guiding staffs in mechanical methods, planned office routine, and other time-saving practices.

Research in the Paint Industry

How the paint industry, through research, has been able to meet the demand for surface coatings possessing such properties as flexibility, hardness, adhesion, and resistance to chemical attack, was described by Dr. J. R. Hosking at the recent F.B.I. conference. In his paper, which is dealt with briefly elsewhere in this issue, the author showed how the availability of synthetic resins had largely overcome the difficulties encountered when only the natural resins were obtainable, by enabling resins to be manufactured to a standard specification to suit any special performance required by the paint maker. The author points out that it is not always possible, however, for the laboratories of an industrial organisation to undertake investigations of a fundamental type, as there always seems to be a large number of urgent problems awaiting solution, with the result that the longer-term research tends to be put aside in favour of the shorter-term problem. For this reason Dr. Hosking considers that an important contribution towards solving problems of a fundamental nature of common interest to any group of related or closely associated industries would be an expansion of the industrial research associations.

The Cost of Track Curvature

An editorial in a recent issue of the *Railway Age* drew attention to the fact that the advantage of curve reduction on fast-running main lines is often considered mainly, if not entirely, in terms of higher speeds and shortened schedules. Other advantages of curve reduction require equal stress, and they are benefits accruing to rolling stock and to permanent way. Excessive curvature requires increased train resistance and requires increased power output; it accelerates tyre wear; and it makes derailment more easy, especially when there are defects in equipment which on straight track might have given no trouble. As to the permanent way, sharp curves cause abnormal wear of the high rail, despite the considerable reduction that curve oiling has brought about, and crushing of the low rail; the thrust on the outer rail imposes undue strain on fastenings, and tends to deteriorate sleepers through

enlargement of the holes in this way; and costs of maintenance in general are increased. In many mountainous locations, of course, sharp curvature is unavoidable, but much is being done on American railways in the systematic reduction of curvature, with the double object of reducing maintenance costs and improving operating conditions. One American railway, in its mountain territory, wherever possible is flattening curves of 10 to 8 deg. ($8\frac{1}{2}$ to 11 ch. radius) to 5 deg. ($17\frac{1}{2}$ ch.) or even 3 deg. (29 ch.); on main routes over which streamline and other trains are intended to operate at sustained high speeds a general aim is to have no curves sharper than 1 deg. 30 min., or just under 60 ch. radius.

Motive Power Comparisons

A note of warning has been sounded by the *Railway Age* concerning superficial comparisons of the relative economics of steam and diesel traction which do not take into account all the relevant factors, and which in particular do not look sufficiently far ahead. The diesel-electric locomotive is an expensive investment. To justify its high capital cost it must be put to the maximum possible use. To ensure such continuous availability, diesel maintenance is segregated in special plants which have been built at considerable cost, and unit parts replacement programmes give the diesel an advantage which steam power has never yet enjoyed. Moreover, specified trains are reserved for diesel handling so that each of the large road diesels may be kept fully used. This preference accorded to diesel power reacts further to the disadvantage of the steam locomotives; on lines on which the proportion of diesel to steam power is increasing, there is at the same time a marked increase in the fuel consumption of the steam locomotives, relatively to the tonnage handled, due to the duties assigned to steam becoming progressively less favourable. If this process continues, eventually the diesels also will have to shoulder their share of the operation which is less favourable to their performance, and which may not even permit of maximum use. Thus the fact that a small percentage of the motive power—the diesel locomotives—at present is showing large savings does not prove that complete "dieselisation" will give proportionately favourable financial results. There may be, as our contemporary points out, a diesel "saturation" point beyond which further diesel investment will be considerably more speculative.

Electric Signal Aberrations

Though signal technicians naturally are fully aware of the position, it is hardly to be expected that the man-in-the-train can appreciate that train delays on electrically-signalled lines can be caused by quite extraneous conditions. During the past winter, for instance, signal troubles have resulted on several occasions from the inability of the electrical grid to maintain its declared frequency, and, as the railways cannot be held responsible for the management of the grid, they have had to bear the blame for other folk's deficiencies. These signal aberrations arise from the use of impedance bonds in the signal circuits, which, being basically inductive coils tuned to 50 cycles per second, do not function correctly when the supply frequency departs appreciably from that value. Even when 75 cycles per second is used for signal circuits, this supply is derived from motor-generators depending on the grid and varies in frequency proportionally with that system. Short of re-equipping the whole signalling system with impedance bonds having a far wider range of tolerance, the railways are powerless when the grid defaults in this way. To be quite fair, moreover, the blame does not lay wholly with the grid, but can be traced back to a Government decision early in the war, which denied the Central Electricity Board sufficiently high priority to secure adequate generating plant to keep abreast of the growth in demands made on it.

Roller Bearings for Locomotive Driving Axles

The Philadelphia & Reading Railroad in 1945 ordered twenty large 4-8-4 locomotives for fast goods traffic, having 5 ft. 10 in. driving wheels and developing a tractive effort of 68,000 lb., which could be augmented to 79,100 with the booster in action. Nineteen of these locomotives had ordinary white metal crown-

bearing axleboxes, whilst one had Timken roller bearings. At the moment the same company has under construction in its Reading, Pennsylvania, shops a further ten locomotives of the same type. This time nine of the ten engines are being equipped with Timken roller bearings and only one has crown-bearing journal boxes; the latter are fitted with Hennessy lubricators. Both leading and trailing bogies are also equipped with roller bearing journals; the former has wheels 3 ft. in diameter, and the latter has 3 ft. 8 in. wheels. The Franklin locomotive booster is applied to the rear axle of the trailing bogie. The tender, which is carried on two six-wheel bogies, and has a total wheelbase of 37 ft. 8½ in., is carried entirely on roller bearings. Of the thirty engines in this class, ten of the tenders have Timken bearings and the remaining twenty have S.K.F. bearings. The very definite swing, after due trial, to the use of roller bearings in these heavy locomotives—the weight of the engine alone is 192.5 tons, of which 124.2 tons are adhesive weight—is the highest tribute to the satisfactory fulfilment by the roller bearings of the very stringent tests which they underwent in this application.

Another Pennsylvania Turbine Locomotive

A further stage in the locomotive experiments in steam locomotion now being conducted by the Pennsylvania Railroad is to be the building of a second turbine-driven locomotive, of which the principal features have been made public. It will be recalled that a turbine locomotive of the 6-8-6 type has been completed recently, in which the general layout of boiler, chassis, and cab does not differ greatly from that of a reciprocating steam locomotive of normal design; the forthcoming "Triplex" locomotive, however, has more resemblance to a large diesel unit. It will be supported on two independent chassis, each of the 4-8-0 type with uncoupled driving wheels, with the bogie leading; the eight driving axles will be driven by steam turbines through gearing. At the leading end there will be a coal compartment accommodating 32½ tons, and an auxiliary water tank; then will follow the cab, with the boiler behind that, and the chimney at the rear end. Coupled to the locomotive will be a water tender, on 12 wheels, of 21,000 gal. capacity. The entire locomotive and tender will have a streamline casing from front to rear, and will measure 137 ft. 6 in. in length, with a total wheelbase of 122 ft. 6 in. Water will be transferred automatically from the tender to the auxiliary front tank, as the contents of the latter are used in the boiler, in order to maintain a constant weight on the driving wheels of the front chassis. Mechanical firing will be simplified by having the coal space on the main engine frame with the boiler. A total of 9,000 h.p. is aimed at in this remarkable design.

"First Class or No Class"

The demand which arises from time to time for one-class travel on the railways seems to be inspired partly by a dislike of the term "first class" as implying a social distinction. This objection, to which we referred in a leading article in our May 31 issue, was dealt with in a contribution by Sir William V. Wood, President, L.M.S.R., to a book entitled "Post-War Britain,"* published at the end of last year. Sir William Wood points out that those who consider that class distinction on railways has a social implication, do not seem to object to the term when applied to a First Class in the Cambridge Tripos, or to advertisements of "first class typing." In Victorian days, railways described their superior accommodation as "carriages of the first class," which in emphasising the vehicle may not have seemed to confer an undeserved distinction on its occupants to the same extent as the current term. Objections to the term "first class" may not be as widespread as its leading critics like to make it appear. A once familiar character, Mrs. 'Enery 'Awkins, had no shame in laying claim to a "first class name," and we notice that the publishers of the book already mentioned have aided her social aspirations by supplying the missing aspirates and correcting her spelling in a passage wherein Sir William Wood refers to her.

* "Post-War Britain," edited by Sir James Marchant. London: Eyre & Spottiswoode, 12s. 6d. net

Economic and Transport Prospects in the United States

SOME time ago the Association of American Railroads decided to study systematically the numerous transport problems which would be of pressing importance in the years directly after the war. The necessary research has been conducted by a series of committees, each composed of railway officers who are fully qualified to deal with its particular range of subjects. One such body, the Subcommittee on Economic Study, has surveyed general economic as well as transport trends in the United States, with special reference to post-war prospects. Its report to the main Committee for the Study of Transportation recently has been published, in accordance with the liberal and enlightened policy observed across the Atlantic. The report is a substantial volume, including 75 statistical tables and 40 charts, which summarises the history of the economic growth of the United States and of the expansion of its transport facilities. Naturally, attention is centred on activities which produce the major portion of railway traffic and revenues, but its authors express the hope that the report will prove valuable to the public, as well as to the railway industry, in formulating policies. In Great Britain there is not at our service any similar analysis of the factors bearing on the transport problems of the after-war tomorrow. This is a distinct loss, seeing that the Government is expected to make an early pronouncement about the transfer of the railways and the road haulage industry to State ownership.

The Bureau of Railway Economics, Washington, D.C., and its Director, Dr. J. H. Parmelee, are chiefly responsible for the material contained in the American report. The general statistics show the progressive trends of the past in population, in agriculture and industry, in construction and in trade. After all widespread wars, the national economy is demonstrated to have risen to new high levels. The United States emerged from the second world war "geared to the highest levels of production ever attained," and facing its greatest trade potential. The report anticipates that from 1947 to 1950 economic activity will rise to a high level—below the war peak, but above former peacetime records. Prospects after 1950 are difficult to appraise, but the report does not throw cold water on suggestions that a long period of prosperity may be in store.

The American transport system is reviewed in an instructive chapter. Before the war the United States had only 6 per cent. of the world's population, but had one-third of the railway mileage, more than two-thirds of the motor cars, and more than one-half of the freight motor vehicles in the world. The supply of transport actually exceeded the demand. A comparison of commercial freight and passenger traffic for 1926, 1939, and subsequent years, reveals marked changes in the shares falling to the various transport agencies. The percentage distribution of freight ton-miles is shown in the table below:—

PERCENTAGE OF TOTAL TON-MILES

	1926	1940	1944
	Per cent.	Per cent.	Per cent.
Railways	76	62	70
Great Lakes	14	14	9
Rivers and canals	2	4	3
Road haulage	4	8	5
Oil pipelines	4	11	12
Other carriers	—	1	1

The railways had the largest decrease of any of the freight carrying agencies during the lean years in the 30's; they also had the largest increase during the wartime boom.

The distribution of passenger-miles is given in the next table:—

PERCENTAGE OF TOTAL PASSENGER-MILES

	1926	1940	1944
	Per cent.	Per cent.	Per cent.
Railways	75	62	73
Electric inter-urban	12	2	1
Inland waterways	4	3	2
Motorbuses	9	30	22
Air carriers	—	3	2

Exact statistics are not available for inter-city travel in private motorcars, but the volume of such travel in recent years has been several times as great as the passenger traffic of all commercial concerns combined. The second world war

temporarily halted the diversion of freight and passenger traffic from rail to road, water and air, but these agencies will soon intensify their efforts to attract business, especially if they continue to receive liberal public aid towards their development.

Dr. Parmelee's statistical apparatus is next used to bring out railway transport trends. One chart indicates that a certain degree of relationship has existed over a period of 35 years between the aggregate railway operating revenue and gross national productivity. Another diagram proves that railway ton-miles have been rather closely correlated to the index of industrial production between 1923 and 1944. The improvements effected in the efficiency and economy of railway working since the first world war are made clear by statistics such as Dr. Parmelee is wont to use in his annual review of railway operations. One outstanding result may be quoted. In 1921 the railways spent \$10.78 in operating expenses to handle 1,000 revenue ton-miles; by 1939 this unit cost was reduced to \$6.43, and, in spite of wartime increases in wages and prices, was practically unchanged in 1944.

On the strength of the elaborate data assembled for its guidance, the Subcommittee frames somewhat rosy estimates of prospective traffic for the years 1947 to 1950. It is careful, however, to point out that it has proceeded on the assumption that the American people will meet and solve their complex post-war problems along sound economic lines. These words were written in January last, before labour troubles had begun to have a serious effect on the reconversion of American industry to a peacetime footing. If the Subcommittee had thought that there was a risk of a labour crisis occurring in May, it might have modified its views about the proportion of the wartime accretions of traffic which the railways were likely to retain in the normal times that we all hope will quickly ensue.

* * *

London & North Western Railway Centenary

ONE of the greatest names in English railway history came into being one hundred years ago, when the London & North Western Railway was incorporated on July 16, 1846, as an amalgamation of the London & Birmingham Railway, the Grand Junction Railway (which in the previous year had absorbed the Liverpool & Manchester Railway), and the Manchester & Birmingham Railway. From the outset, the London & Birmingham Railway had regarded itself as the main line to the North, from which branches would be made throughout the kingdom, and the policy was consistently pursued by the L.N.W.R. of achieving and maintaining this position. In fact, it is not an overstatement to say that the whole structure of the railway system north of the Metropolis took the form it did as the direct result of the purposeful activities of the Euston authorities.

Before even the main line from London to Birmingham was completed, plans were in hand for the formation of branches, either by what became the constituents of the L.N.W.R. themselves, or by local companies desirous of working in friendly association with their larger brethren. The natural corollary, where traffic was heavy, was the subsequent construction of a direct or cut-off line to avoid traversing two sides of a triangle; and the further stage was either the absorption of such lines into the parent system, or their eventual growth into separate self-contained systems with their own direct access to London.

One of these cut-offs was the Trent Valley Railway, between Stafford and Rugby, which introduced to the railway world as its Secretary a young man named Edward Watkin. The Trent Valley line passed to the L.N.W.R. and was opened in 1847. Watkin joined the staff at Euston, but in 1853 he became the General Manager of the Manchester Sheffield & Lincolnshire Railway. His subsequent career brought him a baronetcy and the chairmanship of many railway companies, so that for long he was the greatest opponent of the L.N.W.R. His M.S. & L.R. eventually came to London as the Great Central Railway, the last of the great trunk lines.

An earlier "branch" of the L.N.W.R. was the Midland Railway, which provided the middle link of the first railway

route from London to York and Newcastle. The Great Northern Railway was in effect a great cut-off of this route, and for a time also afforded the Midland Railway separate access to London, before the latter eventually built its own line to St. Pancras and finally threw off the Euston Square influence. The L.N.W.R. and the Midland, of course, came together again at grouping in 1923, but there are those who feel that the loss of identity of the tradition the Midland had built up was greater than the corresponding gain to the group.

Not only in railway politics and operation was the L.N.W.R. the first great power. It set the standard in civil engineering practice with its bridges and excellent permanent way (adopting the fishplated suspended rail joint in 1853, the steel rail in 1862, and introducing the 60-ft. rail). In mechanical engineering, it made world famous the name of Crewe, where the locomotive works (transferred there from Edge Hill by the Grand Junction Railway in 1843) became the most famous training school as well as the foremost railway-owned engine designing and building establishment, associated with the succession of such names as Francis Trevithick, John Ramsbottom, and F. W. Webb.

In the provision of passenger amenities, the L.N.W.R. was usually to the fore, at any rate on behalf of its first class passengers, but it was second only to the Great Western Railway in the preservation of exclusiveness and resistance to the ever-growing tide of "democratisation." Thus, there was only one third class train a day from Euston (at 7 a.m.) until August, 1864, when a second (evening) departure was arranged. Again, L.N.W.R. antagonism to the abolition of second class accommodation caused that facility to be retained by the Euston Square group until the end of Lord Stalbridge's chairmanship on January 1, 1912.

Financially the L.N.W.R. stood high. It paid a dividend on the ordinary capital without a break, ranging from 10 per cent. to 4 per cent., but for more than half a century before grouping averaging nearly 7 per cent. The total capital (including debentures and loans) of £29,616,316 in 1850 rose to £127,885,309 in 1921. Route-mileage increased from 832 to 2,066 in the same period. Net revenue rose from £1,084,294 to £6,771,823, but the operating ratio rose from 55 to 83 per cent. Much more might be written of what was widely termed "The Premier Line," with its familiar chocolate and cream livery (retained after grouping for the Royal Train) and conspicuously clean and handsome black locomotives, but those who wish to refresh their memories further are referred to our Special Number, "The First Main-Line Railway," published on September 16, 1938.

* * *

Standardising Spanish Operating Rules

WHEN the Spanish national railway system was formed, the same problem arose as had been met with in France on the S.N.C.F., namely, the need of common operating and signalling methods, with standardised rules and regulations. Some aspects of the problem have been given in an article in *Ferrocarriles y Tranvías* by Señor Julio Nogues, who has been investigating the whole question of standardising and modernising the fixed signals used on the R.E.N.F.E. system. The earliest signalling arrangements in Spain were very simple, and interlocking did not appear in the country until 1882. In the earliest installations of the red disc—where it was often the only signal at a station—it was an absolute stop signal, and it is so still on those sections forming part of the old National Western Company. On other lines, however, a driver was permitted, after stopping at the disc, to bring his train forward just within its protection, as with the Italian stop signal of the so-called "second category," and this again is still the rule on sections forming part of the former Andaluces Company. It was found, however, that making two stops occasioned unnecessary delays, and many drivers would fail to make the first stop at the signal itself. It appeared desirable therefore to modify the meaning of the signal, so that it became, as in France, a deferred stop signal, and in 1912 the Norte, and in 1914 the M.Z.A. Railway, adopted this way of regarding the red disc.

Thus three different sets of rules are in force applying to the one kind of signal. They are a legacy from the earliest

time interval days and the result is that either the drivers tend not to obey strictly the regulations, but to treat the signal as a mere caution signal, or else time is lost, especially on busy sections, by the rules being carried out properly. These necessarily oblige a driver to begin slowing down on sighting an adverse disc, as he should have his train under complete control by the time he passes the signal. It is a little difficult to understand why, as French practice was so much followed, the Spanish lines never introduced the green and white chess-board or repeater signal, which would have enabled them to get rid of these anomalies, especially as the green light had there—as it still has—the meaning of caution or run at reduced speed. Pending the adoption, however, of a modern system of signalling generally, steps ought to be taken to introduce one common and clearly defined rule applicable to the red disc wherever met with.

Another matter calling for urgent attention is the revision of the rules governing the speed through facing points. The highest permissible speed anywhere through facing points, it is surprising to read, is 40 km.p.h. (25 m.p.h.) and on some routes—the old Andaluces lines, for instance—never more

than 20 km.p.h. (12½ m.p.h.). In addition, the existing signalling is inadequate to cover the requirements where it is desirable to allow a train to take the deviating route and run quickly into a loop to allow another one to overtake it. At present the outer disc has to be kept against such a train, with much loss of time if the rules are faithfully carried out.

A calculation shows that on the Madrid—Corunna run, 837 km. (520 miles) covered by fast trains under the present timetable in 20 hr. 15 min., there are 20 stops occasioned by the red disc signal, which could be abolished, and 42 reductions of speed in passing through facing points, likewise capable of elimination. Other stops are also frequently necessary, due to additional crossings with extra trains, or to crossings being altered to meet the late running of opposing trains, and up to 1½ hr. usually could be gained on the run if the signalling were modernised and the operating rules brought into harmony with those in other countries. By extending these reforms to the entire railway system, Señor Nogues considers that approximately 2 per cent. of the direct train operating costs—over 700 million pesetas annually at present—could be saved.

Publications Received

"Garston Docks: The Timber Port of the West Coast."—We have received a copy of this booklet folder, the first of its type to be published by the L.M.S.R. since the war. It is also the first of a series to be issued dealing with the company's ports. A map and photographs of the three intercommunicating docks at Garston are included. The port, which comprises 95 miles of sidings, has special facilities for timber importing and coal exporting, besides catering for minerals and general cargoes, and its annual tonnage of imports and exports is between two and three million.

Dorman Long Bridges.—For the past 30 years, bridges, buildings and allied structures have been erected in all parts of the world by Dorman, Long & Co. Ltd., Middlesbrough, and some idea of the present capacity of the constructional workshops of this firm may be gathered from the fact that they can produce 80,000 tons of fabricated steelwork a year, and have turned out single girders up to 100 tons in weight. Some representative works of construction carried out by the company, which are illustrated in a newly issued brochure, include the Sydney Harbour Bridge, the Tyne Bridge at Newcastle, the Otto Beit Bridge over the Zambesi River, Pretoria Steelworks, and the reconstructed suspension bridge over the Menai Strait.

Steel and its Practical Applications. By Wm. Barr and A. J. K. Honeyman. Second Edition. London: Blackie & Son Ltd., 66, Chandos Place, W.C.2. 7½ in. × 5 in. 156 pp. Illustrated. Price 8s. 6d. net.—Compilation of the numerous handbooks on steel which have been published during recent years is justified by the remarkable range of the subject matter to be covered. Between the 17 tons per sq. in. tensile strength of pure iron and the 180 tons of the hardest steel wire, between the almost non-magnetic properties of dead soft steel and the cobalt and tungsten steels from which permanent magnets are made, between steels nearly as ductile as copper and as brittle as glass, there lies a field of knowledge which as yet is by means fully explored, and is constantly expanding. This small volume, by two members of the staff of Colvilles

Limited, the well-known Scottish iron and steel manufacturers, compresses a mass of practical information into a limited compass. A measure of its success is that three reprints were needed after its first publication in 1932, and these have now been followed by a second edition. In this edition, the chapter on heat-treatment has been completely re-written, in the light of developments in theory and practice since 1932, and material has been added concerning creep and weldability. Other chapters deal with the testing of iron and steel, the structure of ingot iron and wrought iron, the effect of carbon on the structure and properties of iron, the manufacture of steel and its hot and cold working, plain carbon and alloy steels, surface hardening, high temperature testing, metallurgical aspects of welding and gas cutting, and defects and their detection. Tables of temperature and stress conversion are added, with a comprehensive index. As a concise work of reference this book may be recommended to all those who require to have some knowledge of the properties of steel and the uses to which this metal may be put.

A Factory Went to War.—We have received from the Skefko Ball Bearing Co. Ltd., Luton, an attractive brochure describing the widespread applications of its products to wartime needs. In bringing out this publication, the firm had two main objects in view, namely, to provide a souvenir for employees of the S.K.F. organisation of their service to the country during the war, and to provide a stepping stone to resumption of their normal occupations for employees returning from the services. The brochure is profusely illustrated and well written and it deals in an interesting way with the numerous applications of S.K.F. bearings to every branch of engineering.

New Interlocking Plant at Stockholm East Station. 6 pages 11½ in. × 8½ in. with illustrations. By S. Kullenberg, Electrical Engineer (Traffic Department), Stockholm-Roslagen Railway. Reprinted from *Ericsson Review*.—Power signalling has made rapid progress in Sweden during the last 15 to 20 years and many relay installations are in service, not only on the State but on the private lines. The present publication describes the details of a "panel" layout handling an important

traffic; the signalling is of the type now general in Sweden for new work, with colour-lights as running signals for movements approaching and leaving station limits, and position-light ground signals for movements within them. The apparatus is neat and compact and representative of the latest practice. Both local and long-distance controls are applied to certain pairs of points, for the operation of which a special light-weight machine has been designed. The installation connects with the automatic signalling extending westwards from Stockholm East station.

Sweden: Trade and Industry.—By the General Export Association of Sweden, Stockholm. 12 in. × 9 in., 296 pp., 75 photographs and 4 coloured maps. With an introduction by H.R.H. Prince Wilhelm. The economic life of modern Sweden is largely based on her foreign trade, and this book has been published mainly with the object of making her possibilities as a business partner better known abroad. Although special emphasis is laid on trade and industry, with a brightly written account of Swedish achievements in the fields of engineering, timber, iron and steel, etc., many entertaining glimpses of Swedish life and customs, past and present, are contained in the introduction, and the numerous excellent photographs of mountain, forest, and lake scenery suggest interesting possibilities for a holiday.

Thermit Welding Process.—A folder issued by Murex Limited, Rainham, Essex, describes the Thermit welding process, which enables large iron or steel bodies to be welded at low cost and in such a way that the repair is at least as strong as the original part. The process is based on the chemical reaction which takes place between an intimate mixture of small particles of aluminium and metallic oxides when heated to a suitable temperature. This superheated metal is tapped into a mould surrounding the parts to be joined, filling the gap between them, and amalgamating with those portions of the parent body with which it comes into contact. The entire mass, therefore, becomes a single homogeneous body, which requires only trimming to be ready for service. Murex Limited also runs a training scheme whereby customers can send their own selected employers to the Rainham works to be shown how to carry out ordinary repairs themselves.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

"First Class or No Class"

132 Norwood,

Beverley (Yorkshire). June 6

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is distressing to note that the one class travel heresy has again raised its head. One can only attribute this to the pernicious influences of passenger road transport and our Americanised cinema. Native traditions deserve more respect, and Mr. Rank should move in the matter.

However, all may yet be well. The Commons lead the way, and members of the House of Lords now seek free rail travel. That this will be first class one cannot doubt. One looks in vain for overt sympathy from our present Government, but the extreme Left Wing should lend a readier ear. Else what boots it for ambitious Party members to aspire to our historic second chamber of legislature (I refer, of course, to the Peerless House of Chief Commissars), if the travelling privileges of Government be not maintained?

One class by rail? What nonsense! Besides, our wives would never stand for it.

Yours faithfully,

W. H. NASH

The Pennsylvania Railroad

London, N.W.3. May 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The editorial note about the Pennsylvania Centenary in your May 31 issue might give the impression that the Pennsylvania Railroad was the longest line in the States. Actually the New York Central is longer, but the Atchison, Topeka & Santa Fe leads with 13,114 miles of first track. The Santa Fe has nothing like the density of traffic to be found on the Pennsylvania. A comparison of their freight traffic statistics for 1945 shows this conclusively.

	Atchison, Topeka & Santa Fe	Pennsylvania
Freight train miles	40,862,000	50,775,000
Loaded wagon miles	1,472,281,000	1,968,326,000
Net ton miles (revenue and non-revenue)	40,112,942,000	67,735,861,000
Net ton miles per mile of road per day	8,380	18,510

Passenger traffic statistics tell the same story. The Santa Fe works passenger trains over 9,260 miles of railway as compared with the Pennsylvania's figure of 6,120, but the western railway ran only 29,840,000 train miles against 57,328,000 on the eastern system. On the Santa Fe passenger train miles per mile of road per day numbered 8; on the Pennsylvania they were 26.

Another proof of the immense volume of movement on the Pennsylvania is the quantity of fuel and power required by its locomotives. Last year the quantity consumed was equivalent to 16,590,000 tons, when coal, oil, electricity and other fuels were converted to a coal tonnage basis. This was more than one-tenth of the fuel and power used by all the American railways in operating 227,000 miles of road, and 7,000,000 tons more than the Santa Fe needed for its long, winding trail from Chicago across the central western region of the States.

Yours faithfully,

CIVIS

Locomotive Levities

64, Martyrs' Field Road,

Canterbury. June 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—On page 620 of *The Railway Gazette* for June 7, you comment on the things one often sees chalked on railway engines. This "decoration" is not only confined to football enthusiast engine crews. Many people who travelled through Willesden Junction about a year ago will have seen the shunting engine there on which the owning company's initials had been translated into "Labour Means Security." Whether or not this is worse than another "translation" I have seen (L.N.E.R. becoming "Lazy No Energy Required"), depends, I suppose, on one's political inclinations. That this habit is not confined to this country is testified by a couple of pictures in *The Railway Magazine* of March, 1935, showing German engines decorated with very elaborately-lettered political slogans.

With regard to unofficial names on locomotives, there must be hundreds of them, with their "name" in chalk lettering.

Probably the most famous of these was that applied to a Southern Railway engine during the strike of 1926. This engine—No. A.763, now 1763—received from its volunteer crew the name *Betty Baldwin*, but in this case the name was painted in a nice style of lettering on the front driving-wheel splasher, quite in the approved manner. This engine ran thus named for a long time after the strike had settled and regular Southern Railway enginemmen had taken over again. I wonder if anybody knows who the original *Betty Baldwin* was?

You ask, "Should this form of humour be restrained?" But surely the more appropriate question is "Could this form of humour be restrained?" It seems to me that the only way of doing so would be to return to that high standard of cleaning for every engine (almost a lost art these days), so that what is chalked on to-day is cleaned off again before to-morrow. Or have the Powers That Be been influenced by the appeal of an engine seen passing along one of the main lines out of London a few years ago, and bearing on its grimy tender the statement, "I don't need cleaning, I go better as I am"?

Yours faithfully,

ARTHUR G. WELLS

Milan-Domodossola Electrification

Monkton Combe,

Near Bath, Somerset. May 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to the paragraph on page 569 of *The Railway Gazette* dated May 24, the main line between Milan and Domodossola is double with the exception of the Arona-Gallarate section, which is single track. Part of this route is already electrified on the third rail system, between Gallarate and Milan (Porta Nuova)—25.6 miles; presumably this section will be converted to the standard overhead system, as was done in similar circumstances between Naples and Villa Literno on the electrification of the Rome-Naples *direttissima*.

Yours faithfully,

E. J. M. HAYWARD

Station Nameboards

150, Broomielaw,

Glasgow. June 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. R. O. C. Thomson's suggestion in the May 31 issue, under the heading "Criticisms and Impressions," that station nameboards should be at right angles to the direction of travel, falls to the ground for the following reason, namely, the fact that 50 per cent. of the passengers travel "backs to the engine" with and without window seats; hence the time-honoured injunction, "look before your leap" would have to be "leap before you look!" Rather an unsettling idea!

Yours faithfully,

J. M. SCOTT

London, S.W.

May 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Advocacy of nameboards at right angles to platform faces in Mr. Thomson's letter in your May 31 issue raises a controversial question. One of his arguments is that because roadside warning boards are everywhere at right angles to the highway, railway station nameboards should also be at right angles to the track. Surely the reverse is correct. Highway boards are placed so as to be read by drivers of vehicles facing the direction in which they are travelling. On the other hand, railway passengers, looking out of carriage windows, face at or nearly at right angles to the track, so that, according to this argument, nameboards, to be read by them, should be parallel to the track.

To be seen by the greatest number of passengers, however, a nameboard should be double, with the faces of the two boards inclined at 45 deg. to the track, but in this country, where platforms are so often narrow, an angle of 30 deg. is preferable, so as to allow greater width between the apex of the V and the platform face; this does not materially reduce maximum visibility. If I remember rightly, the Midland railway was a pioneer in the use of such nameboards.

Of more importance than position, however, is the adequate illumination of nameboards at night. They should either be floodlit or illuminated with strip lights along their upper or lower edges throughout their lengths. Nameboard illumination has been improved during recent years in many instances, but much more remains to be done in this direction.

Your faithfully,

PASSENGER

The Scrap Heap

WANDERING TOWELS

Recently the G.W.R. received anonymously one of its lavatory towels by post, to which was affixed a scrap of paper with the words "returned with many thanks—borrowed in 1939—the need was urgent." The B.B.C. mentioned this fact in a broadcast at 8 a.m. soon afterwards, and suggested it might inspire the very large number of people who have removed towels, lamps, straps, etc., from railway coaches during the past five or six years to return them to the company. Two days later the following letter was received by the G.W.R.: "In response to a B.B.C. appeal I return herewith one small towel discovered on return home amongst my baby's nether garments. The article has been well boiled and is quite fit for further use. . . . P.S. I was travelling L.M.S.R. but note towel is marked G.W.R."

100 YEARS AGO

From THE RAILWAY TIMES, June 13, 1846

LONDON AND CROYDON ATMOSPHERIC RAILWAY.—NOTICE OF ALTERATION OF THE TIME AND INCREASE IN THE NUMBER OF THE TRAINS.

WEEK-DAYS.

Down Trains from London.	Up Trains from Croydon.
8 15 a.m. 4 15 p.m.	8 0 a.m. 3 15 p.m.
9 15 a.m. 4 45 p.m.	7 50 a.m. 4 15 p.m.
10 15 a.m. 5 15 p.m.	9 15 a.m. 5 15 p.m.
11 15 a.m. 5 45 p.m.	9 50 a.m. 6 15 p.m.
12 15 p.m. 6 15 p.m.	10 15 a.m. 6 50 p.m.
1 15 p.m. 7 15 p.m.	10 50 a.m. 7 15 p.m.
2 15 p.m. 8 15 p.m.	11 15 a.m. 7 50 p.m.
2 45 p.m. 9 15 p.m.	12 15 p.m. 8 15 p.m.
3 15 p.m. 10 15 p.m.	1 15 p.m. 9 15 p.m.
3 45 p.m.	2 15 p.m. 10 15 p.m.

Note.—The trains marked (*) stop at Forest-hill only; those marked (†) stop at Sydenham and Forest-hill only; the others stop at all the intermediate stations, viz.—at New-cross, Forest-hill, Sydenham, Anerley, and Norwood, with the exception of the 7 15 down train in the morning, which does not stop at Anerley, and the 9 15 down train, which does not stop at Norwood.

SUNDAYS.

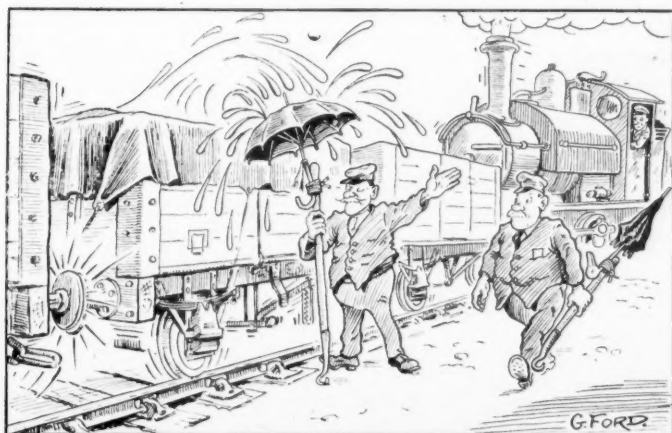
Down Trains from London.	Up Trains from Croydon.
8 15 a.m. 3 15 p.m.	8 15 a.m. 6 15 p.m.
9 15 a.m. 4 15 p.m.	9 15 a.m. 6 50 p.m.
9 45 a.m. 4 45 p.m.	10 15 a.m. 7 15 p.m.
10 15 a.m. 5 15 p.m.	1 15 p.m. 7 50 p.m.
10 45 a.m. 6 15 p.m.	2 15 p.m. 8 15 p.m.
1 15 p.m. 7 15 p.m.	3 15 p.m. 8 50 p.m.
1 45 p.m. 8 15 p.m.	4 15 p.m. 9 15 p.m.
2 15 p.m. 9 15 p.m.	5 15 p.m. 9 50 p.m.
2 45 p.m. 10 15 p.m.	5 50 p.m. 10 15 p.m.

Note.—The trains marked (*) stop at New-cross, Forest-hill, and Anerley only. The others stop at all the intermediate stations, viz.—New-cross, Forest-hill, Sydenham, Anerley, and Norwood.

N.B. First, second, and third class passengers taken by ALL the trains.

May, 1846.

R. S. YOUNG, Secretary.



"—care to be taken to avoid hollow sheeting"

450 MILES TO PLAY DARTS
A darts team of L.M.S.R. workmen from Barassie Wagon Works travelled 450 miles on May 18 to play a friendly challenge match against a team of Watford, L.M.S.R., Road Motor Fitters. To welcome the Scotsmen, the L.M.S.R. staff newspaper, *Carry On*, organised a Gala Night. Before the match began a surprise item was put on the stage for the

unsuspecting Scotsmen. This took the form of Scottish dancing by pupils from the Royal Caledonian School, Bushey, which sent the Scottish darts team wild with delight. After the darts match, which Watford won 8-4, there was an hour of music hall by L.M.S.R. staff from Cricklewood Engine Sheds, and then two hours of dancing to an L.M.S.R. band.

"FIRST CLASS OR NO CLASS"

Mr. L. Lawrence writes, referring to our leader "First Class or No Class" in the May 31 issue: "When I was a boy in the London Brighton & South Coast Railway locomotive sheds over 50 years ago, the railwaymen always used to say that third class passengers were ordinary common people, first class passengers were toffs, and second class passengers just ordinary common people who were making believe they were toffs."

WHY?

Why do trains get delayed?
Trains get delayed because of sickness and absenteeism. Abnormal sickness has its effect on the manpower position. On one day recently, 5,740 "key" operating grades, or 10 per cent. of the total, were absent. As more and more men are demobilised the position will improve, and this should be reflected in improved services. There is, of course, the normal wastage through old age, transference to other jobs, etc., which recruitment will not offset, until recruits have been trained—a process which takes time.—From "The L.M.S. Answers Your Questions."

Both the political and industrial sides seem obsessed with a childlike faith that public utility boards will provide responsible administration and at the same time avoid the "dead-hand" of Whitehall. This delusion overlooks the fact that bureaucracy is inherent in any large-scale organisation where management is in the hands of an industrial autocracy.—Mr. G. Morris, President, Post Office Worker's Union.

PERSONAL QUESTIONS

Making Fun doesn't make Friends!

Kidding, practical jokes, belittling all come in the same class. They undermine the other fellow's sense of confidence and feeling of importance. The results are twofold. Number One, people avoid the chronic kisser. Number Two—the man who undermines the confidence of his fellows cuts down their ability to work. None of us can afford to have poor workers as teammates.



[From "Company Manners" issued by the New York Central system]

NEXT WEEK'S RAILWAY CENTENARY
Edinburgh to Berwick (57½ miles), also Haddington branch (4½ miles), North British Railway, opened June 18, 1846.

PAID BY THE TAXPAYER?

On every train, we are told, one passenger in three is travelling at the Government's expense.

In the new international air transport, only three out of every hundred seats are occupied by persons who have paid for their own tickets.

Every sleeping berth in a railway sleeping car is reserved, in the first instance, for Members of Parliament or other paid Government employees.

Of the growing number of motor-cars on the road, nine out of ten have their licences paid by the Government in one way or another.

Of the petrol used in this country, it is said, 98 per cent. is a charge upon the taxpayer.—Sir William Y. Darling, M.P., in "The Sunday Express."

TAILPIECE

(The L.N.E.R. All-Line Commercial School was opened recently at Faverdale Hall, Darlington, by Sir Ronald Matthews)

To study rail commercial ways

Of selling transportation,

And how to get the best technique

In rail administration,

The active and ambitious male

Should take a course at Faverdale.

At Faverdale a man can learn

The base of operations,

And then develop traffic schemes

At terminals and stations.

There's room for men who might grow stale

To spend a month at Faverdale.

For interchange of modern views

Concerning claims prevention—

Tests, exercises, and debates

Too various to mention—

The busy student of the rail

Should take a course at Faverdale—

He'll pick up in the common-room

In general conversation

The proper method of approach

To railway operation.

I'm quite refreshed, no longer stale—

I've spent a month at Faverdale.

W.E.N.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Raids on Trains in East Bengal

In order to stamp out raids which have become a regular feature on trains between Bhairab Bazar and Dacca on the Bengal Assam Railway, the railway authorities have approached the Government for concerted energetic action to be taken. It is understood that every train travelling between the two above-mentioned stations will, in the future, be accompanied by armed police.

New Stock for Indian Railways

Considerable attention is being given to planning the production of new third class stock. The Railways Advisory Council, which includes a proportion of non-official members, has expressed general approval of the proposed design of third class carriages, but has made a few suggestions for improvement in matters of detail. A coach built to the new design was inspected by members of the committee at New Delhi Station. It is understood that large quantities of the carriages will be turned out of the railway workshops in the near future.

Provided that necessary imports are received in time, it is expected that all important mail and express trains will carry some air-conditioned stock within the next two years. The present total seating capacity of Indian broad-gauge passenger stock is now estimated as follows: first class, 20,000; second class, 41,000; inter-class, 58,000; and third class, 619,000.

SOUTH AFRICA

Financial Position

The result of working the railways, harbours, steamships, airways and aerodromes for February, 1946, was a surplus of £18,169, as compared with a deficit of £53,611 recorded in February, 1945. Revenue was £503,200 more than in February last year as the result of increased receipts for parcels, goods, and coal traffic, catering and bedding, road motor services, harbour services, and airways. Expenditure, owing to higher maintenance and operating costs and cost of living allowance payments, advanced by £431,420.

The accumulated deficit for the eleven months April, 1945, to February, 1946, was £1,244,144, which compares unfavourably to the extent of £1,384,027 with the surplus of £139,883 recorded for the corresponding period of the previous financial year.

Railway Salary Scales

The new salary scales for civil servants, based on the recommendations of the Public Service Inquiry Commission, were announced in the Assembly recently by the Minister of the Interior, Senator C. F. Clarkson. This report, which has been accepted by the Government, is being reviewed by the South African Railways Administration.

The Minister of Transport, Mr. F. C. Sturrock, said that the proposed adjustment in public service scales of pay would necessitate a comprehensive review of the position on the railways to bring some measure of parity between conditions in the railway service and those of the public service.

As the improvements would cost considerably more than £1,000,000 a year to adjust the railway rates of pay, it would be

necessary to increase railway charges in certain directions. The railways were still operating on a pre-war basis of rates and fares, as the 10 per cent. increase applied in 1944 barely covered the cost of the improvements in pay and service conditions then introduced. The addition of more than £1,000,000 a year to operating costs would affect seriously the equilibrium of railway accounts, and steps to raise the necessary additional revenue would inevitably have to be taken.

PALESTINE

Pre-War and Post-War Revenues

The trends of revenue of the Palestine Railways in the immediate pre-war and post-war years are shown hereunder:—

	1945-46 £P.	1944-45 £P.	1938-39 £P.
Coaching ...	929,756	910,156	1,14,743
Goods ...	1,804,105	1,631,362	331,984
Miscellaneous...	123,270	116,604	46,713
	2,857,131	2,658,122	493,440
	Increase or decrease, 1945-46, as compared with—		
		1944-45	1938-39
Coaching	£P. 19,600	£P. 815,013
Goods	+172,743	+1,472,121
Miscellaneous	...	+6,666	+76,557
		+199,009	+2,363,691

The appreciable increase over the pre-war figures is due mainly to the volume of military traffic passing, and to the restriction of movement of road traffic by shortage of commercial road transport. At the same time, there has been a welcome increase in the volume of civil traffic, and the indications are that with the continued development of industrial projects, the internal movement of civil tonnages will increase steadily. During the year ended March, 1946, some 2,158,000 tons of goods were handled, compared with 2,230,932 tons in 1944-45 and 840,000 tons in 1938-39.

Motive Power Problems

Locomotive power has presented a troublesome problem, as a result of the heavy pressure to which the system was subjected during and immediately after the war years. Locomotives had to be worked without overhaul and without proper attention between trips, with the result that eventually the number of engine failures reached alarming figures. The position was affected adversely by the conversion to oil firing, without prior planning or design. This was unavoidable, on account of coal supplies being cut off without warning.

Much has since been done to catch up on the arrears in locomotive overhauls, and the present position is vastly better than it was eighteen or even twelve months ago. Coaching stock and wagons also suffered severely during the war and a heavy programme of repair and overhaul is now in hand.

Changing Traffic Conditions

The following traffic statistics are of interest:—

	1945-46 (approx.)	1944-45	1938-39
Train-km. ...	3,240,000	3,120,214	1,509,380
Ton-km. ...	346,650,000	369,453,661	103,521,025
Passenger journeys	2,345,000	2,212,757	616,009

The increase in train-km. compared with the decrease in ton-km. arises from a material change in the traffic handled. Whereas in 1944-45 full through train loads to and from Egypt formed the bulk of operation, now that imports through Haifa port are return-

ing, incomplete loads with a comparatively short haul predominate.

Attacks on Railway Property

Sabotage by terrorists continued. In less than two months, late in 1945, locomotive sheds were attacked by rifle and machine gun fire, time bombs placed in locomotives, and the track destroyed by explosives in more than 250 places. The climax was reached in January this year when a pay train was mined and blown up, the staff held up at the point of tommy guns, and the payroll of £P.35,000 stolen. Fortunately no employee suffered serious injury. The wrecked train after the outrage was illustrated in *The Railway Gazette* of March 8.

Heavy Traffic at Haifa Port

The citrus crop has been well maintained this year, some 4,500,000 cases of fruit having been shipped from Haifa Port as compared with 1,435,660 cases in 1944-45 and 8,624,142 cases in 1938-39. Exports this year would have been larger but for a shortage of timber for packing the fruit. The majority of groves could not be maintained properly during the war and will take some time to be developed to the pre-war standard. Ports revenue during 1945-46 amounted to £P.594,555, against £P.443,741 during 1944-45 and £P.160,301 in 1938-39.

The release of United Nations shipping from Government control has resulted in a great increase of traffic passing through Haifa Port. During the first 20 days of March, 47 ships with nearly 50,000 tons of import cargo arrived at Haifa. Despite the fact that vessels were worked by day and by night, and although goods were landed at a daily average rate little short of 3,000 tons, the number of ships and the quantity of cargo arriving exceeded the utmost capacity of the port. Some delay has been inevitable because it was neither practicable nor economical suddenly to provide increased staff and labour to cope with the spate of imports.

EGYPT

Diesel Orders from Great Britain

The English Electric Co. Ltd., of London, has recently received an order from the Egyptian State Railways for the supply of 19 complete diesel-electric trains as a result of international adjudication of December 12, 1945, when tenders were received from the United Kingdom, the U.S.A., Sweden, and Switzerland. The same company secured an order towards the end of last year for 27 diesel-electric locomotives (see *The Railway Gazette* of November 9, 1945). The first of these locomotives is due to arrive in Egypt in October this year.

Supply of Steam Locomotives

Tenders have been invited for the supply of the undermentioned steam locomotives, to be submitted by 11.30 a.m. on the dates below to the General Management, Cairo Station, Cairo.

June 22, 1946, for 10, 20, 30 or 40 4-6-0 locomotives
June 24, 1946, for B 2-4-2 locomotives
June 26, 1946, for 2 2-8-2 locomotives

The 4-6-0 locomotives are required for general mixed traffic service on the main line. The 2-4-2 type are for service on the Upper Egypt Auxiliary Railways; and the 2-8-2 locomotives are for banking trains over the hump at Gabbary Marshalling Yard.

Railway Police

The Commandant, Railway Police, in his annual report for 1945, asked to strengthen the force under his command to enable it to meet increased responsibilities; and for the force to be supplied with motor transport to give it greater mobility. He further recommended that the force should be armed with modern weapons.

The Commandant reports that during 1945, 39,927 kg. of hashish, and 60,905 kg.

of opium were seized, in addition to a large number of firearms and a vast quantity of ammunition. There were 1,780 thefts from consignments, 180 cases of pickpocketing, 238 thefts of baggage, 1,289 thefts of railway equipment, and 558 other thefts.

Acceleration of Express Services

Before the war and up to 1941 inclusive, the usual speed of express trains on the Egyptian State Railways was 80 km.p.h. To reduce wear and tear during the war, when spare parts were difficult to obtain, the speed of express trains was, with a few exceptions, reduced to 70 km.p.h. in 1942. From May 1 this year, the speed of express trains has been increased to 75 and 80 km.p.h.

Middle East Railway Conference

The next meeting of the Middle East Railway Conference will be held at Istanbul on June 26, when the Egyptian State Railways will be represented by Kamal El-Khishen Bey, Deputy General Manager. Among the questions to be discussed will be the exchange of rolling stock between Middle East countries, and the resumption of running of the "Orient Express."

The first meeting of the conference, held in Cairo in March, was reported in *The Railway Gazette* of May 3.

CANADA

C.P.R. Ice Consumption

The Canadian Pacific Railway has 612 million pounds of ice ready to provide the necessary air-conditioning and refrigeration services this year. From the Atlantic seaboard to the head of the Great Lakes, ice for all C.P.R. purposes amounts to 125,000 tons, and from the terminal at Winnipeg to Vancouver on the Pacific shores, company operations require 180,000 tons. Not all the ice comes from natural bodies of water. At several points in Western Canada, artificial ponds are scooped out of the ground, and filled with filtered water. The ponds are usually prepared close by storage houses to cut down hauling costs.

A modern air-conditioned car consumes approximately 14 tons in travelling from Montreal to Vancouver. In Montreal terminals alone, a total of 47,000 tons is required for year-round service, and last year from May until October 12,030 tons were needed to service 9,374 air-conditioned cars.

Higher Rates to be Sought

Increases in freight rates will be sought by Canadian railways to meet increasing operating costs. Mr. R. C. Vaughan, Chairman and President of the Canadian National Railways, told the Dominion House of Commons railway committee in Ottawa recently. He said no immediate consideration was being given to an application for increases in passenger rates. The amount of freight increases to be sought had not been determined. He recalled that United States railways had recently asked for a general 25 per cent. increase in freight rates, with special adjustments on some commodities, and said it was likely the same general pattern would be followed in the forthcoming application.

In a statement made to the committee as it launched a study of C.N.R. affairs, Mr. Vaughan estimated traffic receipts for the first five months of this year would be \$20,000,000 below last year. "Our selling prices are frozen," he said, "but our production costs are mounting in onerous fashion. Even a continuation of traffic volume at wartime levels would not suffice to enable the railway to shoulder additional burdens of the magnitude I have outlined without relief of some sort."

While some expenses were reduced as traffic dropped off, others were not. The

post-war traffic was less remunerative than that carried during the war. In the first quarter of 1946, car loadings increased and more freight trains were operated, but revenue was lower. The same situation applied to passenger traffic. They were therefore doing more work for less money, but they were much more concerned about the constantly-increasing costs of operation. There seemed to be no end to the increases in wages and material prices.

Burden of Fixed Charges

The burden of fixed charges also was a matter of grave concern. Their fixed charges in 1945 were \$49,009,000, of which \$26,021,000 was for interest on funded debt held by the public and \$20,306,000 was for interest paid to the Government. They absorbed 11.3 per cent. of gross revenues, a ratio nearly twice that of the Canadian Pacific or the Class One roads of the United States.

UNITED STATES

Coast-to-Coast via St. Louis

Mr. Fred G. Gurley, President of the Atchison, Topeka & Santa Fe Railway, recently revealed the plans of his system for coast-to-coast sleeping car service via St. Louis. Mr. Gurley expressed the belief that when the Santa Fe is authorised to enter St. Louis, it will be in a better position than any other railroad west of the Mississippi River to embark upon the same general plan that it now has in effect at Chicago, which includes through sleeping car operation east of Chicago on the New York Central, Pennsylvania, and B. & O.

Mr. Gurley stated that, as a temporary expedient, they were now engaged in discussions with the Burlington and its connections via Mexico, Missouri, aimed at the early inauguration of through Pullman car service between St. Louis and the West Coast and Texas stations. Mr. Gurley recalled that since the Santa Fe announced in 1945 its intention to seek entrance into St. Louis, and to establish through passenger service from St. Louis, various other St. Louis lines, particularly the Missouri Pacific, had come forward with defensive plans to improve their St. Louis service and had thrown up smoke screens in the form of offering to inaugurate through service via St. Louis in conjunction with the Santa Fe. He pointed out the inconsistency inherent in a through service involving joint Santa Fe operation with a competing line such as the Missouri Pacific, which through stock ownership controlled the Texas & Pacific, and which had such a strong community of interests with the Denver & Rio Grande Western, and Western Pacific via Pueblo.

WESTERN AUSTRALIA

Financial Results to March 31

The financial results of the Western Australian Government Railways for the quarter and nine months ended March 31, 1946, compared with the corresponding periods of 1945, were as shown in the table below:—

	Three months ended March 31		Nine months ended March 31	
	1945	1946	1945	1946
Earnings	1,069,000	1,061,400	3,288,100	3,067,600
Working expenses	927,634	1,022,786	2,782,833	3,021,050
Net revenue	141,366	38,614	505,267	46,550
Interest	261,800	258,900	784,400	782,400
Loss	120,434	220,286	279,133	735,85

While earnings for the quarter were only slightly below those of the March

quarter of 1945, there was a sharp rise in working expenses, resulting in the increase of nearly £100,000 in the loss. For the nine months there was a loss of £735,850, as compared with a loss at the same date in 1945 of £279,133. These figures reflect the decline in the volume of traffic in higher-rated classes, namely, defence traffic, and its replacement by lower-rated commodities such as fertilisers and primary produce; also the rise in working costs over recent months due in some measure to the increased staff as men return from the Services, higher cost of coal used, and increased work on maintenance, particularly in regard to rolling stock, as men and material become more readily available. Also, during the war, costs of wages and materials rose steeply, but with the increased earnings experienced the effect of the rising costs was not particularly noticeable in the financial results. Although earnings are declining, there has been no corresponding reduction in costs—in fact, wages rates and some other costs have increased, and while this position continues further increased losses must be expected.

Operating Statistics

Train-mileage for the quarter totalled 1,638,058, an increase of 60,344 over the previous corresponding quarter. In pursuance of the department's policy of eliminating mixed train travel wherever possible, many mixed services were replaced by fast passenger trains—either diesel-electric railcars or steam trains—in the summer timetable introduced in November, 1945, while new country passenger services were also introduced, and these had the effect of increasing passenger train-mileage. Goods train-mileage also increased, and would have been greater but for coal shortages.

The financial results per train-mile for the quarter were: Working expenses, 149.85d.; interest, 37.93d.; and earnings, 155.31d. The corresponding figures for the 1945 quarter were 141.11d., 39.83d., and 162.62d., respectively.

SWITZERLAND

Romont—Bulle Electrification

The conversion to electric traction of the 11.8-mile standard-gauge line connecting Romont (on the Berne—Lausanne main line) with Bulle (19km.) was completed on May 9. This was the last steam line of the Compagnie des Chemins de fer Fribourgeois.

Rhaetian Results for 1945

Working receipts of the Rhaetian Railways for 1945 were fr. 18,770,000, as compared with fr. 17,810,000 in 1944. Working expenditure, at fr. 13,210,000, showed an increase of approximately 3 per cent. on the 1944 figure of fr. 12,520,000.

Rhaetian Railways 1946 Budget

The 1946 budget of the Rhaetian Railways forecasts total working receipts of fr. 17,861,000, of which fr. 17,177,000 will be from railway traffic proper and fr. 684,000 from ancillary services. The main item of expenditure is fr. 10,068,300 provided for wages, salaries, and staff welfare services. A first credit of fr. 2,285,000 was recently provided for the acquisition of a number of coaches and luggage vans as part of a ten-year programme for the development of the company's rolling stock. Despite the satisfactory development of passenger traffic on the company's system, which, it is believed, will continue to show a favourable trend in 1946, no additional passenger services are envisaged owing to shortage of rolling stock and motive power.

Design, Construction, and Operation of Railway Refrigerated Wagons*

A description of mechanically-cooled equipment for the transport of refrigerated goods by rail

THE design, construction, and operation of refrigerated railway transport is a double problem, depending both on the railways and the refrigeration industry. Whereas the refrigerating technique is fully capable of meeting all the demands made on it, the improvement of refrigerator rolling stock must emanate from the railways themselves, because it is they which are concerned with restrictions in weight, loading gauge, railway practice and cost.

Vans equipped with mechanical refrigeration give from the technical point of view the best answer to refrigerated transport. Before the war wagons of this type had been designed and operated by the Altek company of Antwerp. Other types of refrigerator railway vans could be designed and operated which would preclude deterioration of their contents during transit.

The question of temperature, distance, and commodities is of secondary importance. It is the duty of the railway to provide special service as soon as perishable goods reach it; except in the case of nationally-owned systems, such a service must be paid for by the consignor of the goods.

Unless a refrigerator van has the necessary machinery, goods to be transported at temperatures below the prevailing atmospheric conditions will have first to be cooled by a stationary cooling plant. Railway cold stores at various points would enable goods not only to be precooled or stored after arrival, but also to be grouped to form larger van loads. They would contain also machinery for precooling the vans in which the commodities would be carried. For seasonal traffic, such refrigerated collecting centres could be mobile so as to be transferable from one point to another during slack periods at the former, and even internationally interchangeable.

Insulation of Rolling Stock

It is the aim of railways to move payload as often, as fast, and as economically as possible. Deadload, which means not only the running of empty returns, but also the tare of the vans, must be kept to a minimum.

The appropriate type of chassis must be chosen before the design of the insulated body is begun, because its length will determine the floor area. It will have to be decided whether a type of chassis envisaged for the transport of one commodity may be used for that of another. Meat, being bulky, requires a large floor space; a van containing space for 7 tons of meat could load 13 tons of fruit or 15 tons of fish, butter, or frozen products.

The tare of a van may be determined by the formula tare = constant + p. length, where p is the weight per unit length of all variable parts. A longer van improves the ratio of payload over tare for "bulky" loads, whereas it is uneconomic to run vans with a large floor area for "heavy" commodities which preclude full use of

available floor space because of the weight restrictions which are imposed by the axle pressure.

The insulation of properly designed transport vehicles reduces the consumption of refrigerant. B.t.u. to be stored in insulating material has to be put into it from the same cooling source, thereby prolonging the precooling time of an empty van. Every inch of insulation adds hundreds of pounds to the deadweight; on an average annual mileage of only 100,000, each additional inch of insulation means carrying about 30,000 ton-miles deadload.

Insulating material is a porous filler which has no strength and has to be filled into a hollow space between two liners. The inner liner must be connected to, and supported by, the outer liner, because the load will rest on it. A framework between inner and outer hull, therefore, will be required, and will mean injury to the insulation. The utmost care must be taken in the design of the framework of refrigerator vans so as to reduce the channelling effect of structural members.

Exterior and Interior Lining

Wooden exterior lining weighs about 2.5 lb. per sq. ft., whereas aluminium or reinforced plastic sheets, which require no painting, are easy to apply and stronger, weigh only 1 lb. per sq. ft., and are appreciably thinner; their use on a van of 1,000 sq. ft. surface means a difference of 0.75 tons deadweight. The same is true of the interior lining, with the addition that it may come in contact with foodstuffs. Corrugated or fluted lining is recommended as it adds considerably to the strength of the walls and enables proper support to be given to an interior cantrail which will have to bear a suspended load. The inner liner must be easily washable and allow for steam cleaning so that a van may be used to transport butter after it has carried fish or fruit. Aluminium and its alloys or reinforced thermosetting plastics are considered safe in this respect.

Although the refrigerating equipment of railway vans is no new venture, scarcely one refrigerating engineer has been consulted by the wagon builders with regard to the design of a properly constructed ice-bunker. Unless a refrigerator van becomes a refrigerator plant on wheels, it cannot be the purpose of its source of cold to reduce the temperature of the cargo. The source of cold in a van has nothing to do with the cargo itself; its purpose is to remove heat leaking from the outside to the inside of the walls and any additional heat which may be generated by a particular cargo.

The coolant properly should be located under the roof of the van and extend over its full length, thus allowing the formation of two natural convection air currents. Temperature control within certain limits is self-regulating, as the speed of the moving air depends on the difference between the outside and inside temperatures. As metals are good conductors, it is easy to keep an adequate heat exchange surface permanently at the same temperature as a melting coolant or evaporating refrigerant.

There is little chance of reaching and maintaining inside temperatures lower than

about 43° to 40° with water ice as a source of cold. To reach a lower temperature, salt must be added to the crushed ice to decrease its melting point, a practice less objectionable from the point of view of thermodynamics than from that of the corrosive effect which the brine thus formed has on railway material.

Installation of Cooling Drum

Solid carbon dioxide gives low temperatures, but suffers from the disadvantage of a low point of sublimation and from the fact that it is manufactured in a comparatively small number of plants. There are, however, so-called eutectic mixtures, including sodium chloride with a eutectic point of -6° F., ammonium chloride at +4°, potassium chloride at 13°, or sodium sulphate at +30°. If one or other of these, or even plain water, is sealed in a drum, extending the length of the van, suspended directly under the roof and containing a freezing coil filled with a refrigerant such as ammonia, which can be coupled to an outside refrigerating unit, a practical cooling system for refrigerator vans is formed. By this means the refrigerator circuit is established through the freezing coil and the water or eutectic mixture frozen *in situ* in the drum.

As the ice-making requires some hours, it is sound practice to use this time for simultaneously precooling the van, but it is not desirable to reduce the cooling capacity of the drums by using them for this latter purpose, if an outside refrigerating unit will accomplish it more economically and rapidly. The external surface of the drums, therefore, should be kept comparatively small so that only a little heat can be transmitted to them from the surrounding warm air. A special gilled cooling coil would be located under the roof to precool the van as long as liquid refrigerant passed through it from outside. The outside refrigerator plant might be a railway cold store or a mobile service unit.

When the cooling coil has served its purpose of precooling the van, it still contains some liquid refrigerant and can continue to act as an evaporator or air-cooler if a circuit is established between it and the freezing coil of the drum. The original coil will then serve as a condensing coil to the vapour formed by evaporation of the liquid contained in the air-cooling coil. The system forms a closed refrigerating cycle, without compressor or expansion valve, in which evaporation and condensation are performed at uniform pressure, but at evaporating temperature slightly above condensing temperature. The application of such a system would be one of the most serious attempts to solve the world need for refrigerator railway transport.

E.C.I.T.O. CONFERENCE ON FOOD TRANSPORT.—The European Central Inland Transport Organisation (E.C.I.T.O.) has held a traffic conference at Copenhagen, beginning on June 3, at which the transport of food, especially fish, was among the subjects dealt with. As a result of the Cereals Conference held recently in London, the Scandinavian countries, in particular Denmark, Sweden and Norway, have stated that they are able to assist the serious food situation in Europe by the provision of fish if transport can be obtained. The provision of this transport has, therefore, been one of the tasks of the conference, by the development and co-ordination of such traffic by rail, road, and inland waterway services. The chairman was Professor E. R. Hondelink, Director-General of E.C.I.T.O.

* Fundamental Considerations Affecting Design, Construction, and Operation of Refrigerated Railway Cars. Abstract from paper read by Mr. Francis L. Levy, Dr. Ing., Member of the Institute of Refrigeration, and Consulting Engineer with Messrs. Sandberg, before the Institute of Refrigeration on February 28.

Fluorescent Lighting Developments

G.E.C. installations at Victoria Station and in a London Transport coach



Fluorescent tube lighting on the Continental platform at Victoria Station, Southern Railway

THE production of fluorescent tube lighting of the high-tension, cold cathode type virtually came to a standstill during the war. Previously, on account of its possibilities both as a decorative and highly efficient illuminating medium, it was fast replacing tungsten filament lamp in stores, hotels, cinema and theatre foyers, and many other places where a cheerful and colourful atmosphere was needed.

Tube Lighting at Railway Stations

In 1937 Osram fluorescent tubes of this type were installed for the first time at Malden Manor, Tolworth, Chessington North, and Chessington South Stations, Southern Railway. This was the first time that such a light source had been used in any railway station in the country. In all these installations, tubes of two colours—light blue and pink (or gold) were used, producing a warm, cheerful effect and adequate light of good quality.

Now that restrictions on production have been removed, the installation of high-tension fluorescent tube lighting is moving apace all over the country. One such installation is that recently introduced on the Continental platform at Victoria Station, Southern Railway. Here, 96 Osram fluorescent tubes, giving an intermediate white quality light (midway between the "daylight" and "warm white" colours) are arranged in two lines each covering 250 ft. of platform. They are spaced 8 ft. apart and mounted under a canopy 14 ft. high. Each line comprises 24 units butted together to form a continuous run. Two standard 8-ft. 6-in. tubes are used in each unit.

One line of tubes is positioned near the edge of the platform to provide adequate lighting for passengers getting in or out of trains; the other line gives general illumination on the platform, and lights the benches used by the Customs offices. This system gives even illumination, with minimum shadow, over the whole of the platform, and is proving a great help to the railway staff and the Customs officials, whose task in searching baggage is considerably facilitated. This will be readily understood in view of the fact that the

new lighting provides four times the illumination which was obtained with the original lighting system. The total loading is 4½ kW. The scheme was prepared by the Illuminating Engineering Department of the General Electric Co. Ltd., to the requirements of Mr. A. Cunningham, Southern Railway Lighting Engineer.

A feature of this form of fluorescent lighting is that there is no time lag between switching on the current and the lighting of the tubes. The tubes have a long life and there is only small depreciation of light output. Even when allowance has been made for this depreciation, the resultant intensity will still be considerably higher throughout the life of the tubes, than that given by the original system of lighting. The installation of the tubes, transformers, and high-tension wiring was carried out by Claude-General Neon Lights Limited, and the low-tension wiring was undertaken by Southern Railway engineers.

Fluorescent Lights in Underground Coach

Fluorescent lighting is equally suitable for providing even and adequate illumination inside a railway coach. The system has been adopted in the experimental car placed in service by London Transport early this year (see our February 1 issue), which was designed as a basis for the new stock to be provided on the forthcoming electrification to Amersham. The lighting is provided by Osram "warm-white" fluorescent lamps. These are operated from an a.c. source with a periodicity of 1,200 cycles. This relatively high frequency not only allows the use of small chokes, but permits automatic starting without the use of a starter switch, eliminates the stroboscopic effect, and also improves lamp efficiency. Elimination of the starter switch reduces maintenance, which is an attractive feature to transport undertakings.

In order to use fluorescent lamps, it was necessary to install a motor alternator to provide high-tension a.c. This alternator is of the inductor type, and is driven from a motor running off the 600-volt d.c. traction supply. It is designed to feed two

coaches, and since only one is at present in use, an additional choke enables it to run at half load.

Extensive experiments on the District Line of London Transport with d.c. operated fluorescent lamps had enabled the Board's engineers to overcome the difficulties of installation and maintenance, and to ascertain the fitness of this type of lighting for Underground trains. In these experiments, also, 20-watt Osram "warm-white" fluorescent lamps, each 2 ft. long by 1½ in. dia. had proved quite satisfactory, and, therefore, lamps of the same size and wattage are used in the a.c. installation.

They give just the right amount of light for uniform illumination throughout the coach, and have a sufficiently low surface brightness for them to be used un-screened. There are twenty-four fluorescent lamps altogether (eight in each compartment) providing an initial illumination of 10-15 lumens per sq. ft. at 2 ft. 6 in. from the floor. They are mounted in fittings designed by London Transport, and harmonise well with the general design and decorative schemes of the coach.

Compared with a tungsten lamp installation of equivalent light output, the heat generated by these Osram fluorescent lamps is much lower, and this is a valu-



London Transport experimental car with fluorescent lighting

able feature from the passengers' point of view, especially during the rush hour periods when crowding is prevalent.

Throughout all the experiments associated with this coach, the General Electric Company has been in close collaboration with London Transport, and with Metropolitan Vickers Limited, which firm was responsible for the design of the motor alternator.

TINS FOR PAINTS AND VARNISHES.—The British Standards Institution has published a specification (B.S. No. 1262) for half and one gallon tins for paints and varnishes and other liquid products of the paint industry. Copies are obtainable from the Institution, Publications Sales Department, 28, Victoria Street, London, S.W.1 (telephone: Abbey 3333), price 2s., post free.

Modern Railway Offices in Chicago

Headquarters of the Illinois Central System

IN a brief foreword to a booklet brought out by the Illinois Central System recently, the President, Mr. W. A. Johnston, extends an invitation to all interested in the railway, employees as well as customers, to pay a visit to the chief offices of the company and talk shop, which he says means not only to discuss the running of the railway itself, but also the needs and plans of all those it serves. The remainder of the booklet consists of illustrations of the Chicago offices, and we are indebted to Mr. Johnston for sending us a selection of photographs.

Progressive management and the modernisation of business methods are among the essential requirements of industrial undertakings in these days of growing competition, if they hope to maintain and extend their business and continue to command the confidence of their customers. Offices such as those illustrated in the following pages play an important part in this very necessary policy of modernisation. The Chicago offices create the right atmosphere from the start, for, spacious without being ostentatious, they inspire the visitor with a feeling of confidence; comfortable without being luxurious, they suggest prosperity on a solid foundation; tastefully furnished without being overcrowded with furniture they spell quiet efficiency. The portraits of 14 presidents since 1851 line the walls of the recently renovated board room.

While the offices referred to are situated in Chicago, the large mural map in the executive office, shown below, serves as a reminder to all who enter that the Illinois Central System is very much at home in many States, for it is situated in the southern region of United States railways, and it controls a number of subsidiary lines, including the Yazoo & Mississippi and the Gulf & Ship Island.

The main lines of the Illinois system run from Chicago to Memphis and New Orleans, Chicago to Omaha and Sioux City, and Chicago to St. Louis, and there are also various important branch lines running to Madison, Indianapolis, Louisville, Birmingham, Shreveport, and Gulf-

port, as well as a loop line extending from Memphis via Vicksburg to New Orleans.

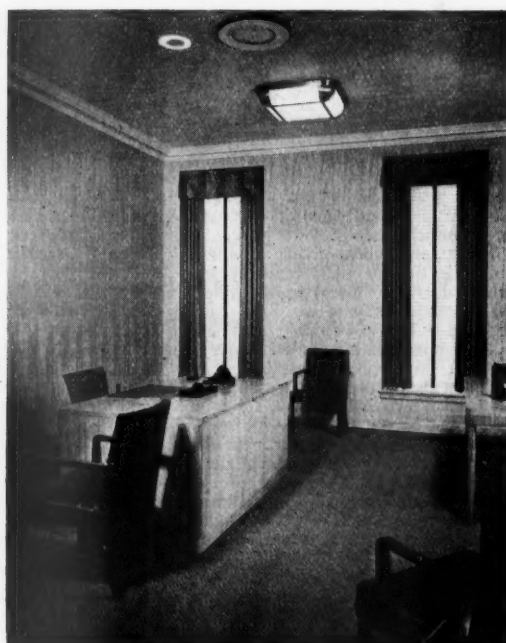
The Illinois Central System controls in addition, through stock ownership, the Central of Georgia Railway, with connection at Birmingham, and this latter company operates over an additional 1,900 miles of track in the States of Georgia and Alabama, and connects with the Ocean Steamship Company of Savannah—which it controls—operating a line of steamships from Savannah to New York and Boston.



Through the office window : Chicago and the railway



The general executive office



Office of the Executive Assistant

Modern Railway Offices in Chicago Headquarters of the Illinois Central System



Office of the President of the Illinois Central System



Part of the general executive office at Chicago

Modern Railway Offices in Chicago Headquarters of the Illinois Central System



Office of the Assistant to the President



Board room of the Illinois Central System

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War-Damaged Bridges in Belgium

Outlining information derived from the investigation of damage caused by demolition and bombing of bridges on the National Railways

By C. F. B. Lemaire, I.C.C. (A.I.G.)

Chief Engineer for Way and Works, Belgian National Railways



Demolished double-line twin-spans bridge near Lobbes, each 138 ft. long

WHEN the Germans invaded Belgium on May 10, 1940, they were faced with widespread demolitions on all main lines of communication. Of the 1,200 bridges over navigable waterways that had been destroyed, 350 were on the National Railways system and 158 on the network of light or secondary National lines. Without assistance or advice from the administration of the National system, the invaders set to work to repair the bridges necessary for their military traffic, including those over the Meuse and the Albert Canal at Visé; by July 15 they had made 80 bridges serviceable.

Altogether, it was estimated that some 55,000 tons of steelwork would be required for rebuilding structures on the National Railways, and a figure of 35,000 tons was worked up to; some 10,000 tons were still in the workshops in course of fabrication at the time of the liberation of Belgium in September, 1944. All these workshops had adopted a "go-slow" policy, and measures were taken to delay the completion of all long bridge spans

and their erection at the various sites. Meanwhile, sabotage and air bombing by the Allies during enemy occupation, followed by the Allied offensive and German retreat, were also responsible for the destruction of several hundred bridges, including some that had been rebuilt either temporarily or permanently between 1940 and 1944. Typical examples are illustrated.

Tests on Metal from Damaged Bridges

Such extensive destruction of railway bridges provided the engineers with a unique opportunity for studying the behaviour of structural materials in resisting exceptional stresses caused by explosives, and they were not slow in seizing it and in collecting a wealth of information from tests upon, and observations concerning, these materials.

Microscopic examination revealed multiple slag inclusions in specimens from wrought iron bridges, and chemical analyses frequently showed a phosphorus content as high as 0.44 per cent., so that a very brittle metal with low ductility was

only to be expected. Tensile and impact tests also proved the weakness of wrought iron in test pieces cut both longitudinally and transversely from bridge members.

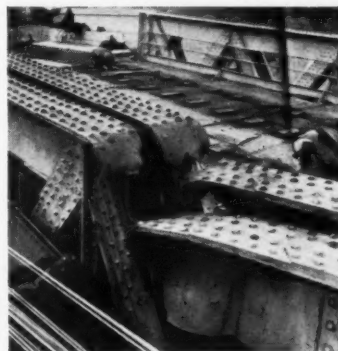
Mild-steel specimens from bridges up to 50 years old were similarly tested, and, though they gave considerably better results than those of wrought iron, fatigue in both metals was shown to be excessive and to increase with the phosphorus content.

Observations Recorded on Damage Sustained

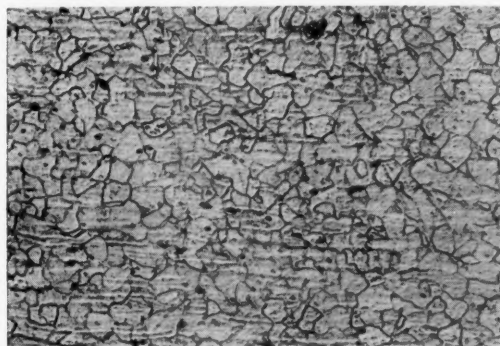
In many instances bridges were damaged only in one-third of the length of the span, and the other two-thirds could, therefore, be re-used; this longer portion was usually found to have pivoted round its support. As a rule, it was noted that the failure of the iron or steelwork in the immediate vicinity of the demolition or bomb explosion had a neat appearance without any reduction in the area, and the metal, in fact, behaved like a non-plastic material. The instantaneous nature of the impact evidently prevented any deformation in the metal such as occurs when loading is progressively applied.

The following are typical notes made to record the damage sustained by the various members of truss spans. Vertical members near the point of fracture were found to have buckled or twisted, in some cases to the extent of 270 deg. The next nearest vertical, 15 ft. 6 in. distant, consisting of four angles back to back, was, however, bent only 3.15 in. out of truth.

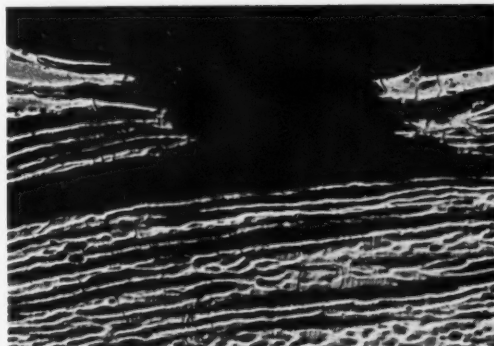
Diagonals in the vicinity of the fracture also underwent buckling and twist, but transverse and longitudinal members not in immediate contact with the explosive



Flanges bent by explosion into arc of circle before fracturing



Typical specimen of mild steel as seen under the microscope



Defects in wrought iron as revealed by the microscope

were, apparently, not deformed, nor were upper chord members 4 ft. 10 in. distant from the point of explosion. Wind-bracing members in panels near the point of fracture, though very rigid, buckled to the extent of 4.33 in., and web members within 8 ft. 3 in. of the explosion were also found to be buckled. In some cases, flanges consisting of from two to four plates were neatly cut, but in others were bent in an arc of a circle.

When the fracture was neat, the rivets were usually intact, but in members that buckled, they yielded in shear at the end close to the explosion. In some instances, plates coming in contact with a river bed were found doubled over in the shape of a hairpin, the rivets being sheared.

In the top and bottom chords the flanges were found to be bent through angles up to 90 deg. and their free edges were torn in all directions, especially between rivet holes. Angles, as well as being torn at the edges and twisted, sustained longitudinal cracks 16 in. to 20 in. long in some cases, but in others, though bent through 120 deg., showed no cracks.

A typical example of damage to a Vierendeel-type bridge is that at Malines. Two illustrations on page 657 show damage to this 207-ft. span. The lower left-hand one shows fractures at one end of

the span. One piece of the top chord was torn out by the explosion and thrown over 100 yd. The fractures of the plates were clean, and, though the ends were bent, they were not cracked and the rivets near the

fractures stood up well to the strain. The lower right-hand illustration shows another clean fracture, this time in the lower chord only, near the Brussels end of this bridge, the gap being just over 3 ft. in width.



Effects of explosion on the lower chord of a girder

An Indian Railways Post-War Exhibition

Models of a rigid-frame shelter, twin crane, and a Canadian built 2-8-2 locomotive

AN Indian Railways Post-War Exhibition was held at New Delhi from March 24 to 31, and the subject of the accompanying illustration was one of the exhibits. The locomotive shown is a fine model of a "CWD" Canadian-built 2-8-2 type recently supplied to the North-Western Railway, India, which was described and illustrated in *The Railway Gazette* of August 10, 1945.

It is shown housed in a model of a

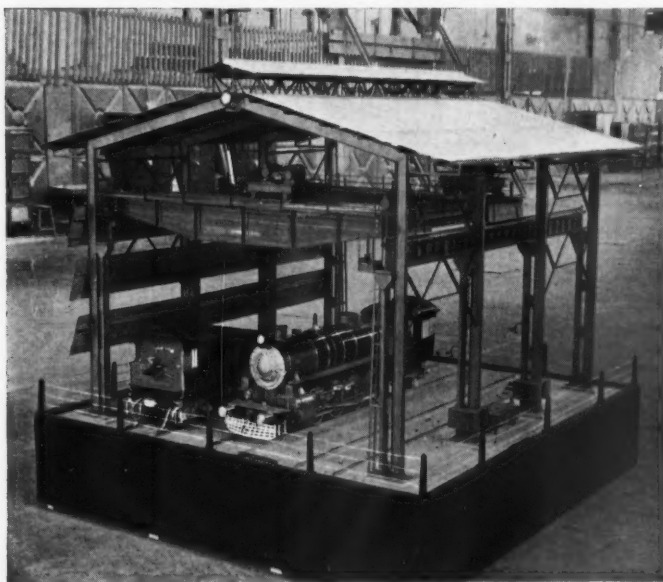
section of the latest type locomotive running-shed shelter now being standardised on that system. The whole exhibit has been built in the railway workshops at Moghalpura (Lahore), where also the models of the engine, tender, and shelter were made.

In our issue of January 28, 1944, we described and illustrated the first of the running-shed shelters designed to provide shade for staff working on engines under-

going intermediate overhaul, and having a louvre type of sheet walling on the sunny side, but open to the north. A development of that type of shelter has now been designed with a rigid frame and various other improvements as can be seen in the illustration.

The repair lines at most of the important sheds on the N.W.R. are served by 85-ton Goliath cranes, but in the new shelters these will be replaced by pairs of 50-ton O.H.T. cranes. The roof principals and crane gantry girder columns are at 30-ft. centres and the shelters will be from 240 ft. to 300 ft. in length. The model shows only three bays, and no end sheeting, which can be provided, however, where necessary.

The first sheds that will be equipped with this new type of shelter are at Rawalpindi, Lahore, and Bhatinda. In embodying both greatly-improved repair facilities and protection from the intense heat of the sun, the design has much to commend it. The modelling itself also leaves little to be desired.



This model was made in the N.W.R. workshops at Moghalpura

PRECISION GRINDING IN THE RAILWAY SHOP.—The Churchill Machine Tool Co. Ltd., Broadheath, near Manchester, has issued a new edition of its illustrated publication, "Precision Grinding in the Railway Shop." There has been continuous development in grinding machine design since the first edition was published, and the present book shows some of the later types in operation in many of the most important railway shops in the world. Special electrical equipment has been incorporated wherever it can aid in the operation of these machines. A brief description and specification is included of the principal machines shown. Among the operations on which they are shown at work are cylinder, piston ring, and piston rod grinding; locomotive, carriage, and wagon axle journal regrinding; diesel engine crankshaft grinding; and repair work on road vehicle engines.

War-Damaged Bridges in Belgium

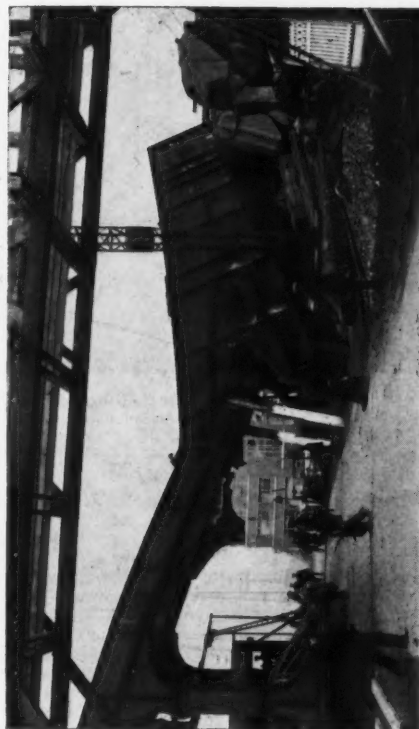
(See article on page 655)



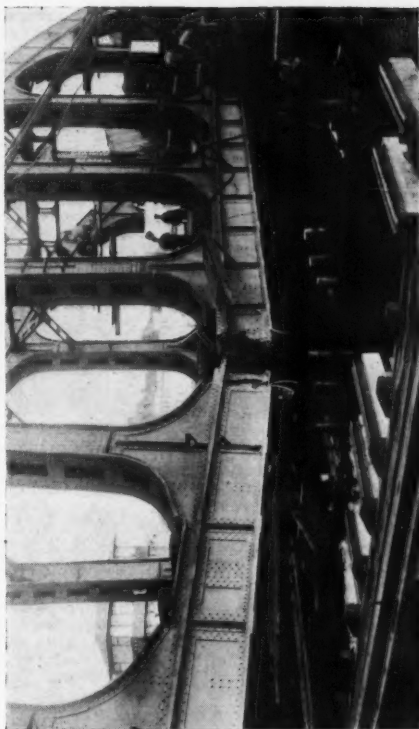
Destruction of a steel plate girder bridge at Chent, on the Brussels—Ostend main line



Damage sustained by a 370-ft. Vierendeel-type bridge across the Albert Canal at Gellik



Fractures in span of Vierendeel-type bridge at Malines. One piece of the top chord was thrown over 100-yd. by the explosion



Another fracture in the Malines bridge, near the Brussels end. Only the lower chord was fractured, the gap being just over 3-ft. wide

"Major-General McMullen"

British-built 2-8-0 austerity locomotive on Longmoor Military Railway



ON January 19 this year a British-built 2-8-0 austerity locomotive No. 79,250, in use on the Longmoor Military Railway, was named *Major-General McMullen*. The nameplate was struck towards the end of 1945, and before the announcement of the K.B.E. (Military Division) which was conferred on Major-General Sir Donald Jay McMullen, C.B., C.B.E., D.S.O., M.I.Mech.E., in the New Year Honours. Major-General Sir Donald McMullen was formerly at the Transportation Train-

ing Centre, Royal Engineers, at Longmoor Camp, where he held the substantive rank of Colonel. From 1937 to 1939 he was Commandant of the Centre. During the war he served as Director of Transportation, British Army, at the War Office, and as such was in direct touch with, and in large measure responsible for, the provision of locomotives and transport facilities for the various theatres of war. Since leaving the War Office he has been Deputy Chief of Transportation Division, Control

Commission for Germany (British Element).

The 2-8-0 austerity locomotives, large numbers of which were built by the North British Locomotive Co. Ltd. and the Vulcan Foundry Limited for the Ministry of Supply, designed when Mr. R. A. Riddles was Deputy-Director General, Royal Engineer Equipment, have seen considerable wartime service both in this country and overseas. A fully illustrated description, including a folding plate, was published in our September 10, 1943, issue, and reprinted as a pamphlet (price 2s.).

Principal dimensions and weights are:

Cylinders (2), dia.	19 in.
Piston stroke	28 in.
Piston valves, dia.	10 in.
Piston valves, max. travel	6½ in.
Wheels, coupled, dia.	4 ft. 8½ in.
Wheels, leading truck, dia.	3 ft. 2 in.
Wheelbase, coupled	16 ft. 3 in.
Wheelbase, total	24 ft. 10 in.
Boiler heating surface—	
Large tubes	451 sq. ft.
Small tubes	1,061 sq. ft.
Firebox	168 sq. ft.
Total evaporative	1,680 sq. ft.
Superheater surface	310 sq. ft.
Combined total	1,990 sq. ft.
Grate area	28.6 sq. ft.
Boiler pressure	225 lb. per sq. in.
Tractive force (85 per cent. b.p.)	34,215 lb.
Adhesion weight	61½ tons
Weight of engine in working order	70½ tons
Weight of tender in working order	55½ tons
Total weight of engine and tender	125½ tons

The tender has eight wheels; it has a self-trimming coal bunker of 9 tons capacity. The water tank, which is of welded construction, has a capacity of 5,000 gal.



View of the 2-8-0 austerity locomotive "Major-General McMullen"

BRITISH THOMSON-HOUSTON JUBILEE.—The fiftieth anniversary of the British Thomson-Houston Co. Ltd., Rugby, was celebrated last month, although the Thomson-Houston partnership actually began in America some years earlier. It was in 1886 that the London firm of Laing, Wharton & Down was formed to exploit in Great Britain the sale of apparatus made by the Thomson-Houston concern in America, and during the next few eventful years of electrical development foundations were laid for the subsequent growth of the British Thomson-Houston Company to the world-wide organisation it has become today. During the first few years, the only manufacturing facilities of the company were at a small works at

Bankside, London, but many pioneer railway, tramway, and lighting installations were undertaken there, including the contract for the power station and electrical driving equipment for the Central London Railway. Land was purchased at Rugby in 1900, and two years later Rugby became the headquarters of the company for engineering, manufacturing, and commercial affairs.

G.W.R. NORTH ACTON-GREENFORD LINE.—The Great Western Railway has let the contract for the completion of earthworks, bridges, station platforms and so on, for electric lines between North Acton and Greenford, work on which was suspended on the outbreak of war.

TEMPERED SPRING CO. LTD. JUBILEE CELEBRATIONS.—To celebrate the fiftieth anniversary of the founding of the Tempered Spring Co. Ltd., the works and staff employees recently presented to Mr. S. J. Young, the Governing Director who founded the company, a portrait in oils of himself by Mr. Francis Dodd, R.A. The company entertained 1,200 employees and friends. The presentation was made by Mr. H. H. Dean, an employee of the company for 45 years. To conclude the presentation ceremony, Mr. Gerard Young, the present Managing Director, presented watches to a number of employees who have been with the company since it started or from shortly afterwards.

RAILWAY NEWS SECTION

PERSONAL

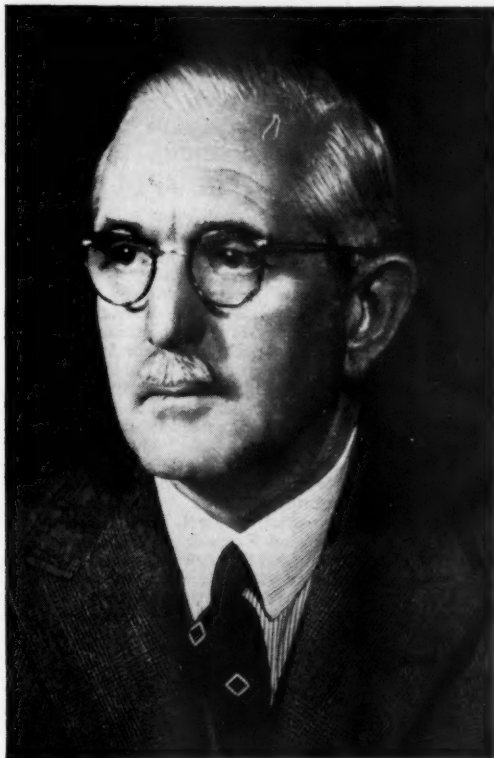
RETIREMENT OF L.N.E.R. C.M.E.

Mr. Edward Thompson, Chief Mechanical Engineer of the L.N.E.R., is to retire on June 30, after a career which has included service on the Midland, North Eastern, Great Northern and London & North Eastern Railways.

Sir Arthur Cecil Griffin, O.B.E., B.Eng., Chief Commissioner of Railways, India, who, as recorded in our May 17 issue, proceeded on leave in May preparatory to

railways in the port area. In 1930 he was appointed Principal of the Walton Training School for the N.W.R. staff. For two periods—July-September, 1931, and April-November, 1933—he officiated as Deputy Agent of that system. In November, 1934, he was made Divisional Superintendent at Rawalpindi, and two years later at Delhi. In May, 1938, he was appointed Secretary, Railway Board (Government of India), which position he relinquished to become Officiating General Manager, N.W.R., in 1940, in which post he later was confirmed. When Sir Arthur Griffin received his

Lt.-Colonel R. B. Emerson, C.I.E., O.B.E., General Manager, Great Indian Peninsula Railway, who, as recorded in our May 17 issue, has been appointed to succeed Sir Arthur Griffin as Chief Commissioner of Railways, India, was born in 1897 and was educated at Bradfield College, and at the Royal Military Academy, Woolwich, which he joined from the ranks of the Royal Flying Corps in 1917. He was commissioned in the Royal Engineers in 1918, and served in India, Iraq, and England until 1927. He then was transferred to civil employment with the Great



Sir Arthur Griffin

Chief Commissioner of Railways, India, 1944-46



Lt.-Colonel R. B. Emerson

Appointed Chief Commissioner of Railways, India

retirement, first went to that country in 1911, when he was posted to the North Western Railway. As an officer in the Royal Engineers Special Reserve, he was recalled to military duty and left India in 1914. In 1916 he was transferred from the European to the Mesopotamian front, where he served under the Railway Directorate and was appointed a Deputy Assistant Director of Railways. In 1918 he was transferred to the War Office for work in connection with the Transportation Commission to the Peace Conference in Paris. His services were lent to the Civil Government of Mesopotamia in 1920, and he served there as Deputy-Director of Railways until June, 1924, and subsequently as Director. During his war service Sir Arthur Griffin was mentioned in dispatches; he was awarded the O.B.E. (Military) in January, 1919. He returned to India in 1925, and was appointed Divisional Engineer, Karachi, N.W.R.; later he was placed on special duty there in connection with the design and layout of

knighthood in the New Year Honours, 1943, he became the first General Manager of the N.W.R. to receive that honour during his tenure of that office. He was appointed to succeed Sir Leonard Wilson as Chief Commissioner of Railways in September, 1944, when Sir Leonard Wilson proceeded on leave preparatory to retirement. During August to October last year Sir Arthur Griffin officiated for Sir Edward Benthall as Member for War Transport of the Viceroy's Executive Council while the latter was on leave. In the October, 1945, issue of the *North Western Railway Magazine* Sir Arthur Griffin was referred to as "the only man in the whole history of Indian railways ever to serve on the Viceroy's Executive Council."

The late Mr. William Whitelaw, who was Chairman of the London & North Eastern Railway Company from 1923 to 1938, when he retired from the board, left personal estate in England and Scotland valued at £731,735.

Indian Peninsula Railway, and served in the Engineering, Transportation, and Stores Departments, and in the General Manager's Office. He was appointed to officiate as General Manager of that railway in 1939, but subsequently reverted to military duty, from which he was released to take up the appointment of General Manager of the same railway early in 1944.

Mr. E. H. Baker, A.M.I.Mech.E., District Locomotive Superintendent, Peterborough, L.N.E.R., who, as recorded in our March 15 issue, has been appointed District Locomotive Superintendent, Gorton, commenced his career as a premium apprentice at Doncaster Works. Mr. Baker attended a works pupils' course at Sheffield University. He saw service at Gorton, Tuxford, Southend, and Liverpool, and in 1935 was made Technical Assistant to the Locomotive Running Superintendent (Southern Area), Liverpool Street, London. In 1937 he became Assistant District Locomotive Superintendent,



Mr. E. H. Baker

Appointed District Locomotive Superintendent, Gorton, L.N.E.R.

Ardley, and in 1942 took up a similar position at Cambridge. In 1944 he was made Assistant to the Locomotive Running Superintendent (Eastern Section), Shenfield, and, in 1945, District Locomotive Superintendent, Peterborough. In his new post at Gorton he is responsible for 484 locomotives and a staff of 4,800 in the Manchester area of the L.N.E.R. bounded by Wrexham, Wigan and Sheffield.

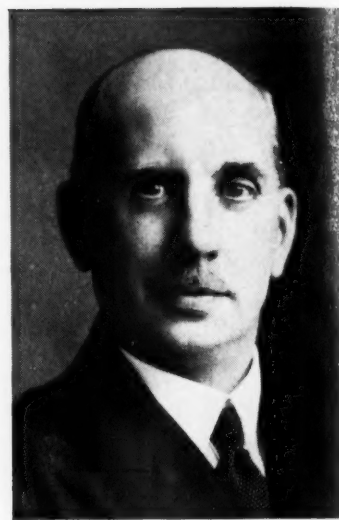
Mr. Charles A. Bremner, who, as recorded in our May 10 issue, retired on May 31 from the position of Steamship Superintendent (Scotland) & Manager of the Caledonian Steam Packet Co. Ltd., Gourock, L.M.S.R., joined the Caledonian Steam Packet Company in 1898, and in his early days served on board the steamers, afterwards joining the staff of the office and passing through all the positions therein until he became Assistant to Captain James Williamson, then Secretary & Manager. In 1909 a pooling agreement was entered into between the Glasgow &



Mr. C. A. Bremner

Steamship Superintendent (Scotland), L.M.S.R., 1932-46

South Western Railway Company and the Caledonian Steam Packet Company to eliminate competition and give an efficient service through the closer working of the Clyde steamers, and in bringing that to a successful issue Mr. Bremner took an active part. On the death of Captain Williamson in 1919 Mr. Bremner succeeded him as Secretary & Manager of the Caledonian Steam Packet Company. Subsequent to the formation of the London Midland & Scottish Railway the fleet of steamers on the Clyde sailing under the flag of the Glasgow & South Western Railway was merged in the former, and on the retirement at the end of 1923 of the Marine Superintendent (the late Mr. William J. Fraser) those steamers came under the charge of Mr. Bremner, who was appointed Steamship Superintendent (Scotland), L.M.S.R., in 1932. In October, 1935, the Williamson Buchanan Steamers, which sailed from Glasgow (Bridge Wharf) to the Clyde coast, were taken over and the combined fleet of Clyde steamers then



Mr. R. D. Kerr

Appointed Steamship Superintendent (Scotland), L.M.S.R.

brought under Mr. Bremner's charge numbered twenty-one.

Mr. R. D. Kerr, District Goods & Passenger Manager, Edinburgh, L.M.S.R., who, as recorded in our May 10 issue, has been appointed Steamship Superintendent (Scotland) & Manager of the Caledonian Steam Packet Co. Ltd., Gourock, joined the Caledonian Railway in 1906. He was appointed to the Office of the Superintendent of the Line, Glasgow, in 1913. In 1924 he was appointed Clerk-in-Charge of the Rates & Fares Department, Glasgow, under the L.M.S.R., and in 1933 he became Rates & Fares Assistant (Passenger) to the Commercial Manager. For many years Mr. Kerr was Scottish Representative of the Caledonian Railway (later L.M.S.R.) on the Passenger Train Rates & Fares Conference and other committees at the Railway Clearing House, London; he was Chairman of the Passenger Train Rates & Fares Conference in 1934. Mr. Kerr was appointed Assistant to Commer-



Mr. E. Morgan

Appointed Lighting & Heating Assistant to Chief Civil Engineer, L.M.S.R.



Mr. W. P. Whitehead

Assistant (Staff & Organisation) to Chief Civil Engineer, L.M.S.R., 1928-46



Mr. W. L. Ada

Appointed Chief Electrical Engineer, Department of Railways, New South Wales

cial Manager (Passenger), Glasgow, in 1937, and District Goods & Passenger Manager, Edinburgh, in 1944.

Mr. E. Morgan, Assistant (Lighting & Heating Section), Chief Civil Engineer's Office, Watford H.Q., L.M.S.R., who, as recorded in our May 10 issue, has been appointed Lighting & Heating Assistant to Chief Civil Engineer, was educated at Sheffield University, where, after graduating with first class honours in 1928, he stayed on for four years carrying out research in the Department of Fuel Technology under the late Professor Wheeler. During that period he held successively the George Senior Research Fellowship and the Town Trustee Research Fellowship, and he contributed a number of articles to the Faraday Society. In 1933 Mr. Morgan joined the Research Department of the L.M.S.R., and in 1936 transferred to the Lighting & Heating Section, Chief Civil Engineer's Office. He has served on a number of committees of the British Standards Institution, and is now a member of the National Illumination Committee.

Mr. W. P. Whitehead, who, as recorded in our May 10 issue, has retired from the position of Assistant (Staff & Organisation) to Chief Civil Engineer, Watford H.Q., L.M.S.R., entered L.N.W.R. service in March, 1896, as an apprentice clerk in the District Superintendent's Office, Birmingham, transferring to Lichfield City in September, 1896, and returning to Birmingham in September, 1897. He then served in the Goods Department at Newport (Shropshire), and afterwards was employed at Oakengates. In 1903 he returned to Newport, and in 1908 transferred to Coventry, until appointed later in the same year Relief Stationmaster for the Birmingham district. In June, 1913, he again returned to the District Superintendent's Office at Birmingham, and in 1914 became Assistant Staff Clerk. In 1922 he went to London in the General Manager's Department at Euston as Outdoor Representative. Mr. Whitehead was appointed in 1928 to the position from which he now retires.

Mr. W. L. Ada, B.E., M.Inst.T., A.M.I.E. (Australia), who, as recorded in our June 7 issue, has been appointed Chief Electrical Engineer, Department of Railways, New South Wales, completed his education at Sydney University, where he held a Peter Nicol Russell scholarship, and graduated with honours in mechanical and electrical engineering in 1909. He has been employed in the Electrical Branch of the New South Wales Government Railways since that date. He served in the Power Section for 17 years, and held the positions of Electrical Superintendent, Assistant Power Superintendent, and Power Superintendent. For ten years he was Chief Assistant Electrical Engineer. In 1927 Mr. Ada visited America and England to investigate various power station and sub-station problems. He also represents the Department of Railways, N.S.W., on the Electricity Supply Association of Australia and on various committees of the Standards Association of Australia.

Mr. H. M. Bullen, Chief Mechanical Engineer's Department, Darlington, L.N.E.R., Mr. R. D. Gillanders, L.P.T.B., and Mr. M. A. H. Ghani, Locomotive Works, Moghalpura, Lahore, N.W.R., India, are among those recently elected Associate Members of the Institution of Mechanical Engineers.

L.M.S.R. STAFF CHANGES Stores Department

Mr. F. Bassett, Head of Orders Section, Chief Stores Superintendent's Office, Watford H.Q., to be General Assistant to Chief Stores Superintendent, Watford, H.Q., in place of Mr. P. R. Hickman, promoted.

Mr. C. F. Havord, Resident Storekeeper, Derby, succeeding Mr. F. Bassett as Head of Orders Section, Chief Stores Superintendent's Office, Watford H.Q.

Mr. J. A. Ellison, Resident Storekeeper, Earlestown, to be Resident Storekeeper, Derby.

Mr. J. Chambers, Deputy Resident Storekeeper, Wolverton, to be Resident Storekeeper, Earlestown.

Mr. W. Barr, Clerk, Stores Department, Wolverton, to be Assistant Resident Storekeeper, Wolverton.

Signal & Telegraph Department

Mr. J. R. R. Pedley, Area Technical Assistant, Signal & Telegraph Engineer's Department, Manchester, to be Area Technical Assistant, Signal & Telegraph Engineer's Department, Leeds, in place of Mr. J. T. Greenall, retiring.

Mr. V. Mitchell, Area Technical Assistant, Signal & Telegraph Engineer's Department, Bolton, succeeding Mr. J. R. R. Pedley as Area Technical Assistant, Signal & Telegraph Engineer's Department, Manchester.

Mr. G. Morris, Telegraph Inspector, Signal & Telegraph Engineer's Department, Preston, to be Area Technical Assistant, Signal & Telegraph Engineer's Department, Bolton.

Operating and Commercial Departments

Mr. F. Sparkes, District Controller, Gloucester, to be District Operating Manager, Gloucester.

Mr. J. H. Westwood, Divisional Controller (Freight Services), Office of Divisional Superintendent of Operation, Derby, to be District Operating Manager, Nottingham.

Mr. J. Waters, Assistant Divisional Controller (Freight Services), succeeding Mr. J. H. Westwood as Divisional Controller (Freight Services), Office of Divisional Superintendent of Operation, Derby.

Mr. E. C. Weston, Assistant to Superintendent of Motive Power, Watford H.Q., to be Assistant to Superintendent, Motive Power (Coal Supplies), Chief Operating Manager's Office, Derby, in place of Mr. H. G. Shortt, retiring.

Mr. W. H. Ensor, District Locomotive Superintendent, Derby, succeeding Mr. E. C. Weston as Assistant to Superintendent of Motive Power, Watford H.Q.

Mr. J. W. Phillips, Assistant, Office of Divisional Superintendent of Operation (Motive Power), Crewe, to be District Locomotive Superintendent, Derby.

Mr. W. F. P. Thompson, Chief Staff Clerk, District Operating Manager's Office, Birmingham, to be Assistant District Operating Manager, Gloucester.

Mr. D. L. Pride, Assistant to District Operating Manager, Birmingham (Western), to be Assistant District Operating Manager, Birmingham (Western), in place of Mr. W. A. G. Suddaby, appointed to special duties.

Mr. L. T. Podmore, District Inspector (Passenger Services), District Operating Manager's Office, London (Midland), succeeding Mr. D. L. Pride as Assistant to District Operating Manager, Birmingham (Western).

Mr. C. L. Bennett, District Inspector, Peterborough, to be Assistant to District Operating Manager, Gloucester.

Mr. A. Udell, Assistant District Locomotive Superintendent, Accrington, to be

District Locomotive Superintendent, Blackpool.

Mr. F. M. Binns, Running Shed Foreman, Blackpool, succeeding Mr. A. Udell as Assistant District Locomotive Superintendent, Accrington.

Mr. W. J. Legg, Assistant District Locomotive Superintendent, Kentish Town, to be District Locomotive Superintendent, Bletchley.

Mr. J. A. W. Knopman, Assistant District Locomotive Superintendent, Wellingborough, succeeding Mr. W. J. Legg as Assistant District Locomotive Superintendent, Kentish Town.

Mr. V. W. Furber, Running Shed Foreman, Farnley Junction, to be Assistant District Locomotive Superintendent, Wellingborough.

Mr. E. L. Thompson, Assistant District Controller, Gloucester, to be Yardmaster, Peterborough.

Mr. H. T. Milton, Assistant District Controller, Kentish Town, to be Yardmaster, Brent.

Mr. E. H. Hodgetts, Controller, Kentish Town, to be Yardmaster, St. Pancras.

Mr. A. E. Fairhead, Head Office Inspector, Office of Divisional Superintendent of Operation (Motive Power), Derby, to be Assistant District Locomotive Superintendent, Rugby, in place of Mr. C. H. D. Read, promoted.

Mr. F. T. Hawkins, Stationmaster, East Ham, to be Stationmaster, Watford Junction, also in charge of Watford North, in place of Mr. F. Shelley, promoted.

Mr. J. Brewster, Chief Clerk, District Goods & Passenger Manager's Office, Edinburgh, to be District Goods & Passenger Manager, Edinburgh, in place of Mr. R. D. Kerr, promoted.

Mr. J. Rigby, Goods Agent, Southport, to be Goods Agent, Warrington, in place of Mr. N. G. McLeod, retired.

Mr. P. Hetherington, Passenger Agent, Wigan, to be Parcels Agent, Liverpool (Lime Street), in place of Mr. G. F. Smith, retiring.

FUNERAL OF MR. E. UZZELL

The funeral of Mr. E. Uzzell, Welfare Officer, Southern Railway, whose death we recorded last week, took place at Golders Green Crematorium on June 1. Sir Eustace Missenden (General Manager) and Mr. John Elliot (Deputy General Manager), Southern Railway, were represented by Mr. A. J. Elmes; and among many others present were:—

Messrs. O. Cromwell (Chief Officer for Labour & Establishment); H. J. Grant, representing Mr. R. P. Biddle (Docks & Marine Manager); C. H. Brazier (Traffic Manager's Staff Assistant) and D. R. Williamson (Docks Engineer, Southampton Docks), Southern Railway; and Mr. Dennet (N.U.R.) and Mr. H. C. Walton (General Secretary, Railway Benevolent Institution).

INDIAN RAILWAY STAFF CHANGES

Mr. R. de K. Maynard, General Manager, M.S.M.R., has proceeded on leave from May 16 to June 30. Mr. E. L. Roberts is acting as General Manager.

We regret to record the death on June 5, at the age of 83, of Mr. Herbert Kelway-Bamber, M.V.O., who was President of the Institution of Locomotive Engineers for 1930-31. He was Superintendent of Rolling Stock, East Indian Railway, from 1902 to 1907. He then joined the Leeds Forge Co. Ltd. as its representative in London, and was General Manager of that company from 1925 to 1928, when he joined the Sentinel Waggon Works Limited, with which he served until his retirement in 1933.

North British Locomotive Co. Ltd.

The annual general meeting of the North British Locomotive Co. Ltd. was held recently in Glasgow. Sir Frederick C. Stewart, Chairman, presided.

The Chairman, in the course of his address, said: When we received your Chairman's remarks one year ago, I did not anticipate that I would today be privileged to address you as Chairman.

I am sure you would not wish to proceed to the business of the meeting without first of all expressing regret which I very feelingly share with you all at the resignation of Mr. William Lorimer, who, after a long and distinguished period of service decided on medical advice that the time had come when he must seek a rest. Mr. Lorimer has been associated with the North British Locomotive Company ever since its incorporation in 1903, first as a director and for the past ten years as Chairman of the company. His connection with the locomotive building industry goes much further than that, he having joined the firm of Dübs & Company in 1897. His great experience, ability, and self-sacrificing services, also the sterling qualities of his character, have commanded the sincere admiration and real affection of all his colleagues. He will be much missed by all connected with the company, but our regret at his leaving us is tempered with the reflection and hope that he will continue to visit the works as much as his health will permit, and give us all the undoubted benefit of his valuable advice, guidance, and pleasure of his company. I am sure you join with me in wishing him many happy years of retirement.

I am very pleased to intimate that at the invitation of your board, Mr. Andrew Simpson Macharg, C.A., Senior Partner in the firm of Messrs. McClelland Ker & Company, has joined your directorate. Mr. Macharg's reputation as an accountant of the highest ability and integrity is known throughout the British Isles in the financial, commercial, and industrial worlds, and I think we are to be congratulated that Mr. Macharg, notwithstanding his many activities and widespread interests, accepted your directors' invitation.

TRADING RESULTS

The result of the year's trading is a net profit of £207,404, compared with £242,343 in the preceding year. After including the balance of profit amounting to £51,380 brought forward from the previous year and deducting the interim dividend paid on preference stock, the profit and loss account shows a balance of £249,409. To meet the company's liability for taxation on profits to date, £100,000 has been placed to taxation reserve and £50,000 is added to the general reserve fund, bringing this up to £283,000.

Having given effect to these appropriations, the available balance is £99,409. Your directors recommend that from this should be paid the final dividend of 2½ per cent. on the preference stock, making with the interim payment 5 per cent. for the year, and a dividend of 5 per cent. on the ordinary stock, both less tax at 9s. in the £; these dividends will absorb £44,687, leaving to be carried forward to next year the sum of £54,721.

During the period that has elapsed since our last meeting we have emerged from the very difficult times forced on us by the impact of war. The advent of peace, however, has not relieved industry of many of those difficulties, but has brought its

own problems. Many industrial concerns which, like ours, during the war years had to divert a large part of their energies to the production of weapons of war, found themselves faced with problems related to the re-establishment of business, changing over from war to peacetime production, and difficulties incidental to the insufficient supply of raw material and labour. Happily, before the cessation of hostilities we had reverted almost entirely to the production of locomotives and their parts, and were thus fortunate in enabling the change over to be effected without much upheaval in the works.

During the year we have been engaged on locomotive building and, as you can readily understand, now the war is over there is a great demand for our products. In the early part of the year under review we made final deliveries on account of the Ministry of Supply contracts and since then have been building mainly for the South African Government Railways and for the Indian market. There are also orders in hand to execute for replacements and spare parts for our make of locomotives pending the time when our customers are in the position to obtain new locomotives.

The order book position is in a satisfactory state and the present position encourages one to think that it will continue so for some time. It is hoped that with the return to our shops of the skilled hands who have been on active service the deliveries will tend to rise in volume. I am pleased to report that the home railways are now in the market for more rolling stock and your company has been successful in booking a large order for engines and tenders for the London & North Eastern Railway. It is hoped that we will this year be able to deliver a substantial part of this order.

From the foregoing remarks you will note that the volume of work in hand is satisfactory, but I should also mention that considerable sums of money will require to be spent on plant and equipment to maintain the works in a first-class condition.

Since the last annual meeting there have been great changes; changes which profoundly affect our industrial outlook. The finish of the second world war brought an entirely new Government which in turn has enforced the somewhat academic creed of nationalisation on some of our major industries—ill-timed measures which have left many in a state of perplexity and indecision. With restrictive controls and the unavoidable delays which result from dealing with a maze of Government Departments, the way of progress is filled with obstacles, but with relaxation and perhaps the elimination of these, together with a full return to industry of our skilled men and apprentices, the position might improve. At the moment the demand for goods of every variety is plentiful and order books are filled, and by our endeavours to manufacture on an economically efficient basis, at the same time maintaining a high standard of working conditions in our factories, we must and will strive to continue to attract orders in sufficient quantity to allow your company to work to its full capacity.

Industry today requires freedom of action—freedom to make its own decisions quickly and freedom to apply the principles and experience of production and commerce on which the foundations of British

trade and prosperity were built and on which they flourished.

Taking all factors into consideration, I feel that we are justified in looking forward with confidence to the future and that all that can be done will be done to preserve the very high standard which your company has attained. This object can be achieved by the co-operation and by the united effort of everyone concerned in undertaking the tasks which lie before us.

Before I close I would like on your behalf to extend a very hearty welcome to those of our employees who served in the Forces and who have resumed their employment with the company. To the relatives of those who have fallen we extend our deepest sympathy. I should also like to commend to you the services of your staff, whose difficulties increased progressively throughout the years of war, and since the cessation of hostilities, have by no means diminished. I know it will be your desire that we tender them our sincere thanks for their loyalty and hard work.

Staff & Labour Matters

R.C.A. Annual Conference

The Railway Clerks' Association held its annual conference at Hastings, from May 20 to 24. Alderman Percy Morris, M.P., in the course of his presidential address, said: "Arrears of maintenance, development of services, improvement of stock, and the provision of sufficient transport for those who will benefit under holidays with pay in the future demand service of a very high standard, and we are prepared to give it, with only one proviso—that rates of pay and conditions of service improve simultaneously."

He said the need for the nationalisation of transport was obvious, and they looked forward eagerly to the proposals of the Minister. If visitors from abroad judged this country from first impressions at the large railway termini they must be very shocked. To flourish, industry should be served by a unified and co-ordinated railway, road, air, and sea transport service instead of a competitive system under which four major groups struggled for supremacy at the public expense. Railway employees would be glad to co-operate in the new organisation.

The conference dealt with a variety of questions, and a resolution by the Derby Branch in respect of the negotiations on the professional and technical staffs programme urging the utmost pressure by the union to obtain "a long overdue measure of justice" was withdrawn on a promise by Mr. C. N. Gallie, the General Secretary, that a special conference would be called of the grades concerned to hear a full report on the negotiations in which the Minister of Transport had been asked to assist.

A resolution passed on nationalisation urged the Government to make sure that all workers should be fully represented in control and organisation of the major industries to be nationalised. One delegate, who moved the rejection of the resolution, said that Russia had started with workers' control, but there was no workers' control in Russia today. They had soon found it was not the way to run industry. "We have to face the fact that if we are going to make a success of nationalisation we want the best brains we can have on the management of the industry," he said. "Do not be led astray

over any specious phrases about workers' control."

Consolidation of the war advance came under discussion and a resolution was adopted, instructing the executive committee to press the matter.

Some concern was expressed by delegates that the National Insurance Bill would have an adverse effect on the superannuation scheme of the railway companies, but Mr. Heady, the Assistant General Secretary of the Association, said that the Parliamentary Secretary to the Ministry of National Insurance had not only given an assurance that there would be no interference with superannuation or pension funds, but that they would continue to be amended, controlled, and directed according to the rules in constitution of the particular fund.

A resolution, calling on the Parliamentary Labour Party to bring in legislation to secure compensation for loss of time and travelling, and subsistence allowances for members of local government bodies, with time off from work to attend meetings, was passed. Another resolution was that a post-war aim of the union should be the abolition of the working of all systematic overtime and that adequate staffs should be provided.

The President announced that the membership of the Association had reached the peak figure of 90,078.

A.S.L.E.F. Annual Conference

The annual conference of the Associated Society of Locomotive Engineers & Firemen was held at Rhyl, from May 28 to June 6. The Conference was presided over by Mr. H. E. Bidwell, who, speaking of the nationalisation of transport, said that adequate participation of workers in control and management would be essential.

Welfare conditions for the staff would have to undergo revolutionary changes, he said, and machinery of negotiation would have to be speeded up and conditions of service brought into line with modern thought.

Most of the proceedings of the conference were in private session.

Clerical Wages—Engineering Industry

The National Arbitration Tribunal recently issued its award on a claim referred to it by the Clerical & Administrative Workers' Union for the establishment of specified scales of minimum basic rates of wages for certain clerical workers in the engineering industry.

The employers parties to the claim were as follow:—

Siemens Bros. & Co. Ltd., Woolwich; Gramophone Co. Ltd., Hayes, Middlesex; S. Smith & Sons (England) Ltd., Cricklewood Works, N.W.2; Standard Telephones & Cables Limited, North Woolwich; Leyland Motors Limited, Kingston-on-Thames; Murphy Radio Limited, Welwyn Garden City; North East Aircraft Components Limited, Gateshead; Sigmund Pumps (Great Britain) Limited, Gateshead; Robert Stephenson & Hawthorns Limited, Forth Bank Works, Newcastle-on-Tyne; Sheepbridge Stokes Centrifugal Castings Co. Ltd., Chesterfield; Ransome & Marles Bearing Co. Ltd., Stanley Works, Newark; Percival Aircraft Limited, Luton Airport; Worthington-Simpson Limited, Newark; Coventry Gauge & Tool Co. Ltd., East Mill, Brechin; Ransome & Marles Bearing Co. Ltd., Dundee; Hall, Russell & Co. Ltd., Aberdeen; Vickers-Armstrongs Limited, Scotswood Works, Newcastle-on-Tyne; Hopkinsons Limited, Britannia Works, Huddersfield; Brown, Bayley's Steel Works Limited, Sheffield, 9; English Electric Co. Ltd., Phenix Works, Bradford; South Wales Switchgear Limited, Treforest; Brown,

Lenox & Co. Ltd., Newbridge Works, Pontypridd; MacTaggart, Scott & Co. Ltd., Station Iron Works, Loanhead, Midlothian; Scottish Plastics Limited, Strathendry Works, Leslie, Fife; Brown Bros. & Co. Ltd., Rosebank Iron Works, Edinburgh, 7; T. McDonald & Sons, aircraft engineers, Leven, Fife; R. & W. Hawthorn Leslie & Co. Ltd., St. Peters, Newcastle-on-Tyne; and members of the following associations: Engineering & Allied Employers' Association (Birmingham, Wolverhampton & Stafford District), Birmingham, 3; Engineering & Allied Employers' Leicester & District Association, Leicester; Coventry & District Engineering Employers' Association, Coventry; North West Engineering Trades Employers' Association, Glasgow, C.2; Engineering & Allied Employers' West of England Association, Burleigh, near Stroud; Engineering & Allied Employers' Leeds & District Association, Leeds, 2; Engineering & Allied Employers' National Federation, Derby & District Association, Derby; Engineering & Allied Employers' Liverpool Association, Liverpool, 2; Blackburn District Engineering & Allied Employers' Association, 13, Cannon Street, Accrington; Preston District Engineering Employers' Association, Queens Chambers, Fishergate, Preston; Engineering & Allied Employers' National Federation, Chester & District Association, Chester; Bolton & District Engineering Employers' Association, Bolton; Burnley & District Engineering Trades Employers' Association, Burnley; Engineering & Allied Employers' Oldham District Association, Oldham; Manchester District Engineering Employers' Association, Manchester, 3.

The claim was for minimum basic rates (exclusive of war allowances) as set out below:—

(a) In the case of the first six firms specified above, that is, those situated within a radius of 25 miles of Charing Cross:—

Age	Male	Female	Age	Male	Female
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
15	20 0	20 0	21	67 6	57 6
16	25 0	25 0	22	72 6	62 6
17	30 0	30 0	23	77 6	67 6
18	37 6	37 6	24	82 6	72 6
19	45 0	42 6	25	87 6	77 6
20	55 0	50 0			

(b) In the case of all other employers specified:—

Age	Male	Female	Age	Male	Female
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
15	17 6	17 6	21	60 0	50 0
16	22 6	22 6	22	65 0	55 0
17	27 6	27 6	23	70 0	60 0
18	32 6	32 6	24	75 0	65 0
19	40 0	37 6	25	80 0	70 0
20	50 0	45 0			

The tribunal finds against the claim as stated, but awards that the employers referred to above, except R. & W. Hawthorn Leslie & Co. Ltd., Newcastle-on-Tyne, shall pay the workers on whose behalf the claim is made at not less than the minimum basic rates per week prescribed in the agreement between the Manchester District Engineering Employers' Association and the Clerical & Administrative Workers' Union, dated July 24, 1941, as subsequently modified, the effect of which is to provide the scales of minimum basic rates per week below appearing, that is to say:—

Age	Male Clerks	Female Clerks	Age	Male Clerks	Female Clerks
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
15	15 0	15 0	19	37 9	33 6
16	18 3	18 3	20	45 3	36 0
17	21 6	21 6	21	61 0	42 6
18	31 3	31 3			

This award is without prejudice to the right of any worker in receipt of a rate in excess of the minimum rates above provided to continue to receive such higher rate.

The award applies as from the beginning of the first full pay period following May 20, 1946.

Research and its Effect on Paint Quality

At the conference held by the Federation of British Industries in London recently, Dr. J. R. Hosking, Ph.D., B.Sc., Director of Research & Development, Paints Division, Imperial Chemical Industries Limited, read a paper in which he stated that the continued prosperity, in fact the existence, of almost any industry, whether concerned with the production of raw materials or of manufactured goods, was dependent to a large extent upon the maintenance of the quality, set as a standard, of its products, and of its ability actually to improve the quality of these products. The quality factor became in general the more significant as competition for markets increased.

In setting up a fixed standard of quality for finished goods the research worker was guided largely by what the sales organisation had to tell him. Having ascertained the facts, it then became necessary for the research department to discover whether such a product, having the required properties and performance, could be made, and, if so, the best method to be adopted in producing it in the plant.

The difficulty of raw material variation had long been associated with the resins. The demands made for surface coatings possessing a variety of improved properties had been met successfully by the paint manufacturer, in many cases as the result of an immense amount of research work towards the production of synthetic resins.

Until relatively recently, the only resinous materials available to the paint manufacturer were the natural resins, chiefly of vegetable origin and usually imported, many of them diminishing in quantity as time went on, for there was no adequate means of replacement. Such materials varied considerably in composition and properties as well as price, and, moreover, in view of their intrinsic properties, limited the paint maker to certain types of surface coating.

The availability of the synthetic resins had largely overcome many of these difficulties, as these resins were manufactured to a standard specification, and important properties such as melting point, viscosity, colour, acidity, etc., could be reproduced accurately, and modified to suit some special performance demanded by the paint maker.

In view of the strides made by the synthetic resin manufacturers, who succeeded so markedly in improving the quality of their products, the natural resin producers had turned their attention to the application of further research to natural resins. They had already effected improvements in quality of natural resins by careful grading, removal of impurities by new methods, chemical treatment such as esterification, blending with synthetic resins, etc., and turned out products more suitable for use by the paint manufacturers.

The resin was not the only raw material which could be modified and improved to influence the quality of a paint. This industry used a great variety of other raw materials, such as pigments, fatty oils, plasticisers, cellulose derivatives, solvents, and driers, and the work involved in improving these materials carried their manufacturers into many fields of scientific research, the success or otherwise of which was reflected in the wares of the paint manufacturer.

It was, therefore, apparent that much of

the research work appertaining to the industries mentioned was closely inter-related, and they should be alive to the mutual benefits these industries could attain by the full exchange of views and co-operation on the part of their various research and related departments.

A considerable contribution towards solving problems of a fundamental nature which were of common importance to any such group of related or closely associated industries would be an expansion of the research associations. It was not always possible for the research laboratories of an industrial organisation to undertake investigations of a fundamental type, as there always seemed to be a great number of urgent problems awaiting investigation, and the longer term research tended to be put aside in favour of the shorter term problem.

Paints for finishing metal articles which had a high degree of gloss might be demanded. This involved a study of the influence of the oil, the pigment, and the resin on paints which dried with a glossy surface, and the physicist was concerned with finding a satisfactory and accurate method for measuring differences in gloss.

The organic chemist, on the other hand, would be concerned with methods for suitably modifying the fatty oil and resin. Surface coatings with higher drying speeds were continually being asked for. Investigations must, therefore, be carried out into the action of certain metallic oxides or driers on the fatty oils and the influence of the degree of unsaturation in the fatty oil molecule. Again, paints were demanded for preventing the growth of marine organisms on ships, and here the task of improving such paints demanded wide facilities for biological research in order to establish the types of organisms they had to deal with, their life cycles, and sensitivity to toxins in the paint film.

In determining the value of a certain coating composition made from a paint or varnish they were led largely by differences exhibited in its physical properties from those of some standard which they considered satisfactory. It was, therefore, important that they should be able to measure such properties as flexibility, brittleness, adhesion, and hardness.

A further instance where an improvement in quality had resulted from research was to be found in the metals industry. A large proportion, probably 80 per cent., of all ferrous and non-ferrous castings was porous to fluids such as water, petrol, or oil. This defect was a serious difficulty, especially during the war years, and in the past had resulted in the discarding of a large number of castings.

Many attempts had been made to seal castings effectively, and improvement in stopping slight leakage could be effected by allowing ferrous castings to rust in ammonium chloride solution. Treatment with oxidised linseed oil was also used, but neither treatment was adequate, especially where the cracks were deep.

It was found, however, that more effective results could be obtained by impregnating castings under pressure with varnishes containing phenol-formaldehyde resins and stoving the impregnated castings at an elevated temperature. By this means the varnish penetrated into the castings and was converted by heat into a resinous material having remarkable strength and resistance to chemical attack. This process was also used with success where repairs had been made to old castings and it was necessary to seal the pores where the inlay had been made.

Lord Ashfield's Message to London Transport Staff

Lord Ashfield, Chairman of the London Passenger Transport Board, has addressed a personal letter to the 80,000 employees in the London Transport organisation, in which he emphasises the importance of the board's "Courtesy Aids Service" campaign. This letter is in the following terms:—

"As those of you who have read the board's annual report for 1945 will know, my colleagues on the board and I have acknowledged to the full your great efforts in keeping the wheels turning under the strain of air attack and the discomforts of wartime conditions. You disregarded all thought of personal danger. Your heroism, cheerfulness and good humour were beyond praise. But the people of London, who are also our passengers, must not be forgotten. Their patience and forbearance were also necessary to help us to carry out our task.

"We in London Transport inherited great traditions of service and courtesy to the public, which helped us to meet the test of war. In these first years of victory that spirit of endeavour which inspired us all is no longer so compelling. It is perhaps more difficult therefore to display, in these trying times, that good-humour and good-fellowship which came naturally to all during the war years.

"It would indeed be against human nature to expect, in all circumstances and at all times, you and your passengers to understand each other's difficulties amid the sometimes unavoidable discomforts of travel. On occasion all of us get 'on edge.' Sometimes it may well be, that it was really the other chap's fault. At other times, perhaps, we may feel that we have not quite lived up to our own ideals of patience and good-natured tolerance. Nevertheless, we are public servants and, however difficult it may be, we owe a special duty of sympathetic understanding to the public whom it is our duty to serve.

"In launching the 'Courtesy Aids Service' campaign, the board is appealing as much to the travelling public as to the staff to co-operate in maintaining the pleasant relationships which have always been so characteristic of the life of the capital. I know that I can rely upon you to do your part in continuing our tradition of service and courtesy, and so enhance yet further our reputation with the London public.

(Sgd.) ASHFIELD."

Questions in Parliament

Railway Fares

Sub-Lieutenant H. L. Austin (Lancaster, Stretford—Lab.) on June 3 asked the Minister of Transport whether, in respect of the proposed increase in passenger rates on the railways, he would consider raising first class fares to 50 per cent. above pre-war level, and correspondingly reduce the proposed increase in third class fares.

Mr. Alfred Barnes in a written answer stated: No. The increases on July 1 will be as already announced. It would, of course, be open to the Charges Consultative Committee to consider any such proposal made to it in connection with its inquiry into the subsequent adjustment of fares.

Mr. R. De la Bere (Evesham—C.) on June 3 asked the Minister of Transport

whether, as the Government had taken about £200,000,000 from the railways during the war, he would confer with the Chancellor of the Exchequer with a view to securing an allocation of some of that money to reduce the deficit on the railway receipts and eliminate the need for an increase in passenger fares and freight charges.

Mr. Alfred Barnes stated in a written answer: No. As indicated in the statement I made on May 29, the Exchequer will bear not only the full amount of the deficiency in respect of the first half of this year, but also any deficiency that remains after the increased charges come into effect.

Railway Control Agreement

Sub-Lieutenant H. L. Austin (Lancaster, Stretford—Lab.) on June 3 asked the Minister of Transport if he would make a statement outlining the purposes of the annual grant of £43,000,000 to the railway companies and when a revision of that grant was intended.

Mr. Alfred Barnes (Minister of Transport) stated in a written answer: The sum of £43,469,000 represents the annual payment to the controlled undertakings, the earnings of which accrue to the Exchequer through the Control account. No provision for the revision of this sum is made in the existing Control Agreement and none is intended.

L.P.T.B. Fares

Lt.-Colonel M. Lipton (Brixton—Lab.) on June 3 asked the Minister of Transport whether he would arrange to restore the 1d. fare and such concessional fares as 1s. all-day tickets and 6d. evening tickets on the road services of the L.P.T.B.

Mr. Alfred Barnes stated in a written answer: I would refer Colonel Lipton to the statement which I made on May 29. I have asked the Charges Consultative Committee to advise me as to the best method of adjusting the Board's fares.

Workmen's Tickets on Railways

Mr. A. M. F. Palmer (Wimbledon—Lab.) on June 3 asked the Minister of Transport if, in view of the suggested increase of railway fares, he would consider extending the time for the issue of workmen's tickets to 8.30 a.m.

Mr. Alfred Barnes in a written answer stated: No. Any extension of the time for the issue of workmen's tickets would seriously aggravate peak-hour traffic difficulties.

Dumfries-London Night Rail Service

Major Niall Macpherson (Dumfries—Lib. Nat.) on June 3 asked the Minister of Transport whether he would improve the night train service from Dumfries to the south, which had recently been curtailed by the cancellation of one of the two night trains.

Mr. Alfred Barnes in a written answer stated: Now, as before the war, two night trains run from Dumfries to London, and I am not aware that this service is inadequate. No advertised trains have been cancelled, but an additional train for Service personnel, on which the public was allowed to use surplus accommodation, is no longer required and has recently been discontinued.

Railway Staff Canteen Facilities at Liverpool

Mrs. Elizabeth Braddock (Liverpool, Exchange—Lab.) on June 3 asked the Minister of Transport whether he was aware that no staff canteen facilities were provided at Lime Street Station, Liverpool, although approximately 750-850 employees

were needing that service; and what steps he would take to see that the canteen was provided.

Mr. Alfred Barnes in a written answer stated: During the war approval was given to the provision of a large number of railway staff canteens on Government account, and in July last the railway companies were informed that new schemes not already approved could not be regarded as wartime works, but must be considered as part of the permanent equipment of the railways and financed by them. I am informed that the company is not prepared to finance a canteen at Lime Street.

Burma Railway Official Killed

Major Sir Basil Neven-Spence (Orkney & Shetland—C.) on June 3 asked the Under-Secretary of State for Burma how Mr. Stanley, a Burma railways official, had lost his life on or about April 14.

Major Arthur Henderson (Under-Secretary of State for Burma): I have received the following report. Mr. Stanley and his wife were travelling with six others in a compartment of a train from Mandalay to Rangoon. In the early morning of April 20 three unknown Burmans entered the compartment and when the train was in motion held up the passengers with

a revolver. Mr. Stanley did not appear to understand Burmese and did not comply with the demands of the robbers who thereupon shot and killed him and jumped from the train. Arrests have been made.

FRY'S METAL FOUNDRIES LIMITED.—On the occasion of his seventieth birthday on May 13 last, Mr. John Fry, the founder of Fry's Metal Foundries Limited, associated since 1925 with the Eyre Smelting Co. Ltd., was presented by his staff with his portrait in oils, the work of Mr. Francis Hodge, R.O.I.

British Railway Shareholdings in Road Transport

From the annual reports of the four main-line railways for the year ended December 31, 1945, it appears that the sums invested in associated bus undertakings are:—

	£
L.M.S.R.	2,848,180
L.N.E.R.	2,348,561
G.W.R.	2,300,133
S.R.	2,038,984
Total	9,535,858

In the first three cases these amounts may not agree with the totals of the holdings shown in the accompanying table,

but they are the amounts of the subscriptions.

Goods transport by road is not susceptible of such easy definition, for the railways use many of their own parcels and goods motor vehicles (including mechanical horses), and also have large investments in some important firms of goods hauliers. The four main-line companies have invested £3,183,564 in Hay's Wharf Cartage Co. Ltd. (of which Pickfords Limited is a subsidiary). Up to 1943, the railways had £1,342,996 invested in Carter Paterson & Co. Ltd. As a result of the Pickfords and Carter Paterson merger for operational

purposes, which was announced in July, 1943, Carter Paterson became a subsidiary of Hay's Wharf Cartage, and the amount now invested in Hay's Wharf Cartage represents the sum of the investments previously held in this company and in Carter Paterson. The L.N.E.R. holds £84,808 in Currie & Co. (Newcastle) Ltd. and £17,000 in J. W. Petrie Limited; and the L.M.S.R. £142,939 in Wordie & Co. Ltd., and £135,049 in Joseph Nall & Co. Ltd. Some £4,825,281 is accounted for by railway-owned parcels and goods road vehicles and £2,829,023 by garages and stables; these figures, added to those of investments in goods hauliers, make a grand total of £11,217,664.

RAILWAY SHAREHOLDINGS IN PASSENGER ROAD TRANSPORT AT DECEMBER 31, 1945, SHOWING EARNINGS FOR THE PAST YEAR

Associated company	Issued share capital	L.N.E.R.		L.M.S.R.		G.W.R.		S.R.	
		Holding	Earnings†	Holding	Earnings†	Holding	Earnings†	Holding	Earnings†
Aldershot & District Traction Co. Ltd. ...	250,000 Ord. ...	£	£	£	£	£	£	£	£
W. Alexander & Sons Ltd.* ...	825,000 Ord. ...	112,500	35,000	112,500	35,000	—	—	82,721	8,272
Birmingham & Midland Motor Omnibus Co. Ltd. ...	250,000 6% Par. Pref. ...	125,000	—	125,000	—	—	—	—	—
City of Oxford Motor Services Limited ...	1,440,000 Ord. ...	—	—	432,000	64,800	288,000	43,200	—	—
Crosville Motor Services Limited ...	100,000 8% Cum. Pref. ...	—	—	—	—	113,000	13,560	—	—
Cumberland Motor Services Limited ...	226,000 Ord. ...	—	—	—	—	—	—	—	—
Devon General Omnibus & Touring Co. Ltd. ...	74,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Eastern Counties Omnibus Co. Ltd. ...	1,100,000 Ord. ...	—	—	412,071	32,966	137,357	10,989	—	—
Eastern National Omnibus Co. Ltd. ...	150,000 Ord. ...	—	—	49,999	9,000	—	—	—	—
East Kent Road Car Co. Ltd. ...	200,000 Ord. ...	—	—	—	—	40,917	6,137	27,279	4,092
East Midlands Motor Services Limited ...	150,000 7% Cum. Pref. ...	—	—	—	—	—	—	—	—
East Yorkshire Motor Services Limited ...	756,000 Ord. ...	184,106	22,092	25,282	3,034	—	—	—	—
Hants & Dorset Motor Services Limited ...	200,000 5% Cum. Red. Pref. ...	—	—	—	—	—	—	—	—
Hebble Motor Services Limited ...	900,000 Ord. ...	225,000	24,750	225,000	24,750	—	—	151,355	12,108
Highland Transport Co. Ltd.† ...	450,000 Ord. ...	—	—	—	—	—	—	—	—
Lincolnshire Road Car Co. Ltd. ...	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Maidstone & District Motor Services Limited ...	250,000 Ord. ...	83,333	11,666	41,667	5,833	—	—	—	—
Northern General Transport Co. Ltd. ...	300,000 Ord. ...	149,362	22,404	—	—	—	—	213,556	38,440
North Western Road Car Co. Ltd. ...	150,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Ribble Motor Services Limited ...	120,000 Ord. ...	15,000	2,250	45,000	6,750	—	—	—	—
Scottish Motor Traction Co. Ltd. ...	35,000 Ord. ...	—	—	14,875	1,312	—	—	—	—
Southdown Motor Services Limited ...	200,000 Ord. ...	79,931	7,993	19,985	1,998	—	—	263,492	29,643
Southern National Omnibus Co. Ltd. ...	750,000 Ord. ...	—	—	—	—	—	—	—	—
Southern Vectis Omnibus Co. Ltd. ...	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Trent Motor Traction Co. Ltd. ...	831,081 Ord. ...	365,767	36,577	—	—	—	—	—	—
United Automobile Service Limited ...	300,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Western National Omnibus Co. Ltd. ...	1,200,000 Ord. ...	124,444	22,400	248,888	44,800	—	—	242,792	24,279
Western Welsh Omnibus Co. Ltd. ...	1,005,979 Ord. Stock ...	—	—	530,445	53,044	—	—	271,100	18,977
West Yorkshire Road Car Co. Ltd. ...	1,000,000 6½% Cum. Pref. ...	—	—	—	—	—	—	57,500	9,200
Wilts & Dorset Motor Services Limited ...	750,000 Ord. ...	—	—	—	—	—	—	15,000	900
Yorkshire Traction Co. Ltd. ...	540,288 Ord. ...	75,147	7,515	150,293	15,029	85,191	13,630	36,510	5,842
Yorkshire Woollen District Transport Co. Ltd. ...	1,627,233 Ord. ...	798,412	146,488	—	—	—	—	—	—
Totals	2,000,000 Ord. ...	3,024,912	535,622	3,168,293	508,885	2,318,215	231,966	1,392,029	157,898

* W. Alexander & Sons Ltd. ordinary shares are 15s.

† Highland Transport Co. Ltd. shares are 17s. The L.M.S.R. holds 17,500 ordinary shares

‡ Profits distributed as dividends in 1945

Notes and News

Traffic Inspectors Required.—Two traffic inspectors are required by the Sudan Railways. Candidates, who must be at least 28, should have good railway and docks training, and experience in commercial and operative work. Full particulars are given in Official Notices, page 667.

Engineering Draughtsman Required.—An engineering draughtsman is required by the Iraqi Government Railway for three years in the first instance. Candidates must have had experience in a civil engineering drawing office on a British or Colonial railway and have a good knowledge of permanent way layouts. For full particulars see Official Notices, page 667.

Growth of Industry in North.—New industry is becoming established in the post-war North-West, North Midlands, and West Riding, to the extent that the L.N.E.R. Industrial Agent has received 128 inquiries for line-side sites and factories during the past twelve months. The railway has been asked to find factory floor space totalling over two and a half million sq. ft., of which three-quarters of a million sq. ft. is for engineering, and the remainder for food, chemicals, clothing, paper and printing, confectionery, and furniture.

L.N.E.R. Clyde Services.—The L.N.E.R. steamer *Jeanie Deans*, which has been absent from the Clyde for about seven years on Naval service, is rejoining the L.N.E.R. Clyde fleet. After re-conditioning by A. & J. Inglis Limited, Pointhouse, Glasgow, a trial run was made on May 31. The steamer has been serving with distinction as a minesweeper and anti-aircraft vessel round the coasts of Great Britain. Now the opportunity has been taken to bring the vessel as up to date as possible in present conditions. Since September, 1939, the L.N.E.R. Clyde services have been carried on solely by the *Lucy Ashton*. In a few weeks' time the diesel-electric paddle vessel *Talisman*, which bore the name of H.M.S. *Aristocrat* on

war service, and is nearing completion of re-conditioning to peacetime requirements, will rejoin the company's fleet and enable a further amplification of the sailings to be made.

Traffic Between Great Britain and Eire.—British and Irish railway companies and cross-channel shipping companies have given notice that the scales of charges for customs clearance services on traffic between Great Britain and Eire will be increased by 50 per cent. from July 1. (See Official Notices, page 667.)

Engineering Assistants Required.—The Crown Agents for the Colonies require civil engineering assistants (senior and junior) for engineering designs department at their London office. Candidates for the senior posts should have passed the A.M.I.C.E. examination and those for the junior posts parts A and B of that examination. See Official Notices, page 667.

John Summers & Sons Limited.—Consolidated trading profit of John Summers & Sons Limited for 1945, after charging administration expenses, was £1,290,887, against £1,272,275 in 1944. After meeting prior charges, depreciation, and taxation, the surplus for the year was £460,188, as compared with £432,846. The dividend declared on the reorganised ordinary capital is 8½ per cent.

Bricklayers Arms Goods Depot Re-union.—The staff at Bricklayers Arms Goods Depot, Southern Railway, recently gave a re-union dinner and concert to those members who have returned from war service. Of the 594 who joined up, 19 lost their lives, 15 were prisoners-of-war and one is posted as missing. Among the guests at the re-union dinner and concert were:—

Messrs. R. M. T. Richards (Traffic Manager), O. Cromwell (Chief Officer for Labour & Establishment), F. Gilbert (Deputy Chief Officer for Labour & Establishment), A. E. Hammett (Commercial Superintendent), E. E. Young (London District Freight Superintendent), R. H. Petherick (Goods Agent, Bricklayers Arms), C. H. Brazier (Staff Assistant

to Traffic Manager), F. H. Marshall (Assistant London District Freight Superintendent), Southern Railway; and F. Aggett (Organiser, National Union of Railwaymen).

Coventry Gauge & Tool Co. Ltd.—Mr. H. H. Harley, Chairman of the Coventry Gauge & Tool Co. Ltd., said in his speech at the annual general meeting that the company was engaged actively in fostering the export side of its business. Indications from South Africa were that the new company which they had formed there, in

British and Irish Railway Stocks and Shares

Stocks	Highest 1945	Lowest 1945	Prices	
			June 11, 1946	Rise/ Fall
G.W.R.				
Cons. Ord.	60½	47½	57½	— ½
5% Con. Pref.	124½	104½	117	—
5% Red. Pref. (1950) ..	107½	101½	104½	—
5% Rt. Charge	137½	120	129½	—
5% Cons. Guar.	135½	117	126½	—
4% Deb.	118	106	117	+ ½
4½% Deb.	119½	108	117½	+ 1
4½% Deb.	124½	111½	120	—
5% Deb.	138	124	133½	—
2½% Deb.	83	74½	86½	—
L.M.S.R.				
Ord.	33	23½	28	+ 1
4% Pref. (1923)	65	50	55½	—
4% Pref.	80½	69½	79	— ½
5% Red. Pref. (1955) ..	106½	99½	102½xd	— ½
4% Guar.	106½	97	102½	— ½
4% Deb.	110½	102	109xd	—
5% Red. Deb. (1952) ..	110½	103½	106½	—
L.N.E.R.				
5% Pref. Ord.	8½	5½	5½	—
Def. Ord.	4½	2½	2½	—
4% First Pref.	62½	49½	55	—
4% Second Pref.	33½	24½	27	+ ½
5% Red. Pref. (1955) ..	103	96	100	—
4% First Guar.	104½	95	102	— ½
4% Second Guar.	97	89½	95	—
4% Deb.	109½	91½	94½xd	— ½
4% Deb.	109½	101	109xd	—
4½% Red. Deb. (1947) ..	103½	100	100	—
4½% Sinking Fund	106½	103	104½xd	—
Red. Deb.	106½	103	104½xd	—
SOUTHERN				
Pref. Ord.	79½	63	74½	— ½
Def. Ord.	27	20½	20	—
5% Pref.	104	104	116	—
5% Red. Pref. (1964) ..	117	107	110½	—
5% Guar. Pref.	135½	117	125½	—
5% Red. Guar. Pref. (1957) ..	117	106½	112½	—
4% Deb.	117	104½	115xd	—
5% Deb.	137	124	129½	— 1
4% Red. Deb. (1962-67) ..	112	104½	108½xd	— 1
4% Red. Deb. (1970-80) ..	113½	104	109½xd	— 1
FORTH BRIDGE				
4% Deb.	106	103	105	—
4% Guar.	106	101	104	—
L.P.T.B.				
4½ "A"	125	117	124½	—
5% "A"	135	127	133½	—
3% Guar. (1967-72) ..	100	97½	104	—
5% "B"	125½	115	120½	—
5% "C"	70	58	60	—
MERSEY				
Ord.	37	31½	30½	—
3% Perp. Pref.	72½	68½	72	—
4% Perp. Deb.	104½	104	105	—
3% Perp. Deb.	84	78½	82½	—
IRELAND*				
BELFAST & C.D.	8½	6	7½	—
G. NORTHERN				
Ord.	34	24½	38	—
Pref.	52½	42½	61	+ 2
Guar.	80	68	91½	—
Deb.	97½	87½	101½	—
IRISH TRANSPORT				
Common	—	—	18/3	+ 3d.
3% Deb.	—	—	102½	— ½

* Latest available quotation



Sir Ronald Matthews, Chairman, L.N.E.R., unveiling the nameplate of the 2,000th L.N.E.R. locomotive, "Edward Thompson," at Marylebone on May 31. Mr. Edward Thompson, Chief Mechanical Engineer, is seen standing next to the Chairman (see news article in our May 31 issue)

OFFICIAL NOTICES

Sudan Government

SUDAN RAILWAYS require Two **TRAFFIC INSPECTORS** for service in the Sudan. Candidates should have good railway and docks training and experience in commercial and operative work. Preference will be given to applicants with certificates in railway extension courses. Minimum age, 28 years. Provident Fund Contract, subscription 7½ per cent. of salary, 2 years' probation, with view seven years' minimum service. Starting rate, £E.420 or more, according to age, qualifications and experience, with periodic increases on recommendation up to £E.920. Cost-of-living Allowance now 35 per cent. of salary with maximum of £E.180. Outfit Allowance £E.40. There is at present NO INCOME TAX in the Sudan. (£E.1 = £1 0s. 6d.) Free passage on appointment. Strict medical examination.

Further information and forms of application can be obtained from the Sudan Agent in London, Wellington House, Buckingham Gate, S.W.1. Envelopes should be marked "Traffic Inspector."

Notice

CUSTOMS REQUIREMENTS.
TRAFFIC BETWEEN GREAT BRITAIN AND
EIRE
(Merchandise and Live Stock by Goods and
Passenger Services.)

THE British and Irish Railway Companies and Cross Channel Shipping Companies hereby give notice that the Scales of Charges for Customs Clearance Services on traffic between places in Great Britain and places in Eire will be increased by 50 per cent. on and from 1st July, 1946. (Details will be supplied on application.)

The revised charges for Live Stock will be as under:-

	At Head or Truck Rates.
Per Head	1d.
Minimum per consignment ..	3s. 0d.
Maximum per consignment ..	6s. 0d.

conjunction with the Brooke Tool Manufacturing Co. Ltd. and two South African companies, would meet a definite need in South Africa and help to extend their business. The exhibition recently held at the company's works in Coventry had been visited by upwards of 3,000 persons, including overseas visitors, personnel of Government departments, and representatives of great industrial organisations.

North British Locomotive Co. Ltd. Agents in Egypt and Sudan.—The North British Locomotive Co. Ltd. states that the North East Africa Trading Company, S.A.E. Egypt, 8, Fouad First Street, Alexandria, the London office of which is situated at Clarendon House, 11-12, Clifford Street, New Bond Street, W.1, has been appointed its agent in Egypt and the Sudan. It will also look after the company's interests in Syria, Lebanon, Palestine, Iraq, Persia, and Saudi Arabia.

London Transport Coach Tours.—London Transport coach tours of London and district were resumed on June 11. There are three tours—a morning run, covering Westminster and the City, and two afternoon tours, one through the West End and the Northern Heights, the other to London's Country, including visits to Windsor and Hampton Court. Guides are in attendance and are specially chosen for their wide knowledge of London. A special leaflet describing fully the scenes visited on each tour can be obtained from stations and inquiry offices.

Holland Appreciates Help by L.N.E.R. Staff.—Towards the end of last year a collection of over 2,000 garments was handed over by Mr. C. M. Jenkin Jones, Divisional General Manager (North Eastern Area), on behalf of the L.N.E.R. staff at York, with £110 in cash, in response to an appeal by Mr. J. S. Gans, who was promoting the local effort for "Help to Holland." Mr. Gans gave his assurance that each garment would find an individual recipient, and he has recently received a number of letters expressing thanks for the articles, including a number of special cards from persons who must have received pieces of clothing to which labels had been attached stating

ENGINEERING ASSISTANTS—CIVIL (SENIOR AND JUNIOR) required by the Crown Agents for the Colonies for their Engineering Designs Department, at their London Office. The appointments carry a scale of salary of £200 × £18 × £400 per annum (junior) with a higher scale of £400 × £18 × £525 per annum (senior). Commencing salary fixed according to qualifications, experience, and age. Appropriate consolidation addition at Civil Service rates also payable, amounting to £90 per annum for Senior posts. In Junior posts the amount will be fixed according to commencing salary but will not exceed £90 per annum. The posts are not pensionable, but there is an Office Gratuities Scheme.

Qualifications (Senior). Candidates must be first class draughtsmen and have had considerable experience in a Civil Engineer's or a Structural Steelwork Firm's Drawing Office. They must be capable of preparing detailed designs of bridges and buildings in steel; some reinforced concrete experience would be an advantage. They should have passed the Associate Membership Examination of the Institution of Civil Engineers or hold equivalent exempting degree.

Duties.—Calculations, Designs and Specifications of steel structures, including Bridges and Buildings and general civil engineering design work.

Qualifications (Junior). Candidates should have spent at least one year in a Civil Engineer's or Structural Steelwork Firm's Drawing Office and have had some experience in steelwork design; some experience in Railway Permanent Way details would be an advantage. They should have passed Parts A and B of the Associate Membership Examination of the Institution of Civil Engineers or hold equivalent exempting degree.

Duties.—Calculations, Designs and Specifications of Steel Structures, including Bridges and Buildings. Write, quoting E.2135A, to Ministry of Labour and National Service, Technical and Scientific Register, Room 572, York House, Kingsway, London, W.C.2, before June 25, 1946.

that they had been collected by L.N.E.R. employees.

Hoffmann Manufacturing Co. Ltd.—A dividend of 7½ per cent., tax free, has been declared on the ordinary stock for 1945, the same as the distribution in the preceding year. A loss of £32,092 is shown on the year, but the directors are transferring £100,000 from income tax reserve to profit and loss account. In 1944, after transferring £25,243 from investment reserve, a profit of £77,606 was shown.

G.W.R. Restores Channel Islands Service.—The Great Western Railway will restore its Weymouth—Channel Islands passenger steamer service tomorrow night, June 15. The service will be operated by the ss. *St. Helier* which has just completed an austerity re-fit after war service. Accommodation is provided for 750 passengers. Three sailings in each direction will be given weekly, outwards on Tuesday, Thursday and Saturday nights, and from the Channel Islands on Tuesday, Thursday and Saturday mornings. London passengers will leave Paddington for Weymouth at 9.10 p.m. and are due Guernsey at 7 a.m. and Jersey at 9.30 a.m. the next morning. Returning passengers will leave Jersey at 7.15 a.m., Guernsey at 9.30 a.m., and are due at Paddington at 7.50 p.m.

Centenary of the North British Railway.—The centenary of the opening of the Edinburgh-Berwick line, with a branch to Haddington, the first to be built by the North British Railway, falls on June 18. This railway, which was the first to cross the Border from Scotland into England, was the Scottish link which joined two years later with the York, Newcastle & Berwick Railway to complete the through East Coast route between Edinburgh and London. To mark the occasion the L.N.E.R. will hold a public exhibition at Waverley Station, Edinburgh, on June 19 and 20, which will demonstrate the advance made in railway development. A collection of the most modern locomotives and rolling stock will be on display, contrasted with a locomotive built in 1870 and the North British Railway horse-drawn "Dandy" coach first used in 1861. A

Overseas Employment

ENGINEERING DRAUGHTSMAN required by the Iraqi Government Railway for three years in the first instance. Salary between I.D.40 and I.D.50 a month, according to qualifications and experience, plus high cost-of-living allowance between I.D.11½ and I.D.15 a month, according to salary and dependants. (I.D.1 = £1.) The post is not pensionable, but there is a Provident Fund. Free passages. Candidates must have had experience in a civil engineering drawing office on a British or Colonial Railway and have a good knowledge of permanent way layouts, or alternatively have had considerable experience in a large drawing office and possess a sound knowledge of building construction, including the design of steel and reinforced concrete bridges and structures. Written applications (no interviews), giving essential details: (1) Full name, (2) date of birth, (3) industrial training and experience, (4) name and address of present employers, (5) details of present work, should be sent to the Secretary, Overseas Department (Ref. 1603), Ministry of Labour and National Service, Norfolk House, 51, James's Square, London, S.W.1. Applications cannot be acknowledged.

INDUSTRIAL Glazing, Roof Repairs and Black-out Removed in any part of the country.—Wells & Partners Ltd., Building and Roofing Contractors, 9, Raglan Street, Harrogate, Yorks. 'Phone: Harrogate 3061.

GUEST, KEEN, WILLIAMS LTD. Calcutta and 30's of really good education and sound general engineering and commercial knowledge. Good pay and prospects, as company is expanding substantially.—Box 12, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

centenary history entitled "The First Railway Across the Border," fully illustrated, is to be published.

Mexican Railway Taken Over by Government.—The Mexican Government formally took over the former British-owned Mexican Railway at a simple ceremony on June 1. The Government opened negotiations for the purchase of the railway last year, as recorded in our issue of September 21, 1945. The board of the Mexican Railway Co. Ltd. announces that, subject to contract, the purchase price has been agreed at ps. 4½ million. Of this, ps. 15 million have been remitted on account, the balance to be payable when all legal formalities in London are completed. A scheme of distribution will be submitted to the debenture holders and proprietors as soon as possible.

London Transport Victory Posters.—A new series of four posters, designed by Fred Taylor, R.I., R.D.I., has been displayed at all London Transport stations to coincide with the Victory celebrations. The posters give the artist's impressions of famous London scenes—Westminster Abbey, Trafalgar Square, Piccadilly Circus, and Whitehall. Each view is framed by a border on a grey ground, which gives the effect of a plate mounted in a book. Under each picture is an appropriate quotation. Mr. Fred Taylor has designed many posters for the Underground Railways, the London General Omnibus Company, and London Transport. Since 1908—when he produced his first picture for the Underground Companies—"A View of Hampstead," he has contributed 87 poster designs for transport undertakings in London, most of them of topographical and architectural subjects.

Forthcoming Meeting

June 22 (Sat.).—The Permanent Way Institution (Manchester & Liverpool Section), London Road, Temperance Institute, Southport. Lantern Lecture. "Bridge Strains. The Effects of Permanent Way on the Strength of Structures," by Mr. F. L. King, A.M.Inst.C.E., of Manchester.

Railway Stock Market

The cheerful undertone which featured stock markets before the holiday was continued this week, and with business in most sections tending to increase, values have maintained an upward trend. Demand for British Funds was on a good scale, but the main market feature has been steady buying of leading industrials, such as Turner & Newall, Imperial Chemical, Courtaulds, and Dunlop Rubber which again moved higher on balance.

Buying interest has centred on these and other leading industrials, partly because the Government's nationalisation proposals, with all the perplexities and complications of compensation and other matters, have had the effect of placing a wide range of securities outside the investment categories of many investors who naturally favour shares of companies which are not under the threat of nationalisation.

Contrasting with the further rise of values in other sections, the nationalisation groups remained dull and have been inclined to lose further ground. Colliery shares failed to benefit from a number of dividend increases, and in iron and steels, although Babcock & Wilcox, Colvilles Davy Engineering, and Vickers became firmer, Dorman Long, United Steel, Guest Keen and Stewarts and Lloyds were again lower on balance. Nevertheless, the view is growing that, so far as can be judged, many iron and steel shares are probably undervalued, assuming a fair compensation basis in respect of nationalisation. In some cases, however, it is apparent that part of a company's business will be nationalised and part left to private enterprise; and moreover there is great uncertainty as to which sections of the iron and steel industry are to come under Government control. Consequently, until

the position is clarified, it is difficult to arrive at a sound basis for valuing iron and steel shares.

After continuing to fall back on conflicting market views and calculations as to possible bases for nationalisation compensation, home rails showed a moderate rally, the lower levels attracting some buying interest. The selling which followed the announcement of higher railway charges and fares was not heavy; but with buyers showing caution and a waiting attitude, prices of junior stocks and some of the lower priced preference stocks have fallen back sharply on balance. The steadier tendency which subsequently developed reflects in part the opinion that even if the annual fixed rental payable under the existing control agreement were taken as the basis for nationalisation compensation, junior stocks would be undervalued at current levels. It should, of course, be borne fully in mind that there has never been any suggestions in responsible quarters that the fixed rental would form the basis for compensation. This would in no way provide a fair deal for stockholders; and as has been often emphasised, the railways have never abandoned their right to standard revenue as defined in the 1921 Act.

Although firmer at the time of writing, Great Western has declined further on balance from 58½ to 57½; the 5 per cent. preference stock was maintained at 117 and the guaranteed stock at 126; the 4 per cent. debentures at 117 were fractionally higher. L.M.S.R., after falling to 27½, attracted buyers, recovering to 28, which, however, compared with 28½ a week ago. L.M.S.R. 1923 preference, after receding to 55, firmed up, and at 55½ was the same as a week ago; but

the senior preference (79) was 1½ down. L.M.S.R. guaranteed stock remained at 102½ and the 4 per cent. debentures rallied to 110.

L.N.E.R. second preference improved to 27, compared with 26½ a week ago, and the first preference, after 55, recovered to 55½; but the first and second guaranteed, at 102 and 95 respectively, were lower on balance. Comparison with a week ago shows that Southern deferred has strengthened slightly to 20½; the preferred was ½ down at 74½. On the other hand, the 5 per cent. preference strengthened to 116 and the 4 per cent. debentures were again maintained. Although fractionally lower on balance, London Transport "C" rallied to 59½, after receding to 59. Metropolitan Assented stocks was a point down at 53½.

Argentine rails again reflected hopefulness regarding the attitude of the Peron Government and continued vague talk of a change in the peso-sterling rate. The further rise in values has been general, but buying interest centred mainly on the debentures. Among the latter Buenos Ayres Great Southern 4 per cents. were 7½, comparing with 7½ a week ago; the ordinary stock has moved up from 12½ to 12½, and the 5 per cent. preference from 28½ to 30½. Among other debentures, Buenos Ayres Western 4 per cent. rose from 68½ to 74½, Central Argentine 4 per cents. from 64½ to 68½, while Buenos Ayres & Pacific 4 per cent. debentures were 84. In other directions, Mexican Railway 6 per cent. debentures further rose to 71½. Nitrate Railway shares were marked up to 83s. 9d. on the news that negotiations for the sale of the undertaking to the Chilean Government are in progress.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffic for week		No. of Week	Aggregate traffic to date			Shares or Stock	Prices					
			Total this year	Inc. or dec. compared with 1944/5		Totals		Increase or decrease		Highest 1945	Lowest 1945	June 11, 1946			
						1945/6	1944/5								
South & Central America	Antofagasta ...	834	2.6.46	£ 20,270*	—	15,730	22	£ 712,520	£ 676,240	+	£ 36,280	Ord. Sk.	12	8½	10½
	Arg. N.E. ...	753	1.6.46	ps.265,700	—	—	48	ps.14,142,900	ps.14,205,600	—	ps.62,700	"	10	5½	6
	Bolivar ...	174	May, 1946	3,742	—	928	21	22,144	25,635	—	3,491	6 p.c. Deb.	8½	5½	6½
	Brazil ...	—	—	—	—	—	—	—	—	—	Bonds	25	17	27½	
	B.A. Pacific ...	2,771	1.6.46	ps.1,883,000	—	ps.187,000	48	ps.109,531,000	ps.105,454,000	+	ps.4,077,000	Ord. Sk.	7	5	6½
	B.A.G.S. ...	5,080	1.6.46	ps.2,800,000	—	ps.57,000	48	ps.170,793,000	ps.160,151,000	+	ps.10,642,000	Ord. Sk.	13½	10½	13
	B.A. Western...	1,924	1.6.46	ps.1,270,000	—	ps.70,000	48	ps.57,961,000	ps.54,450,000	+	ps.3,511,000	"	12½	9½	14½
	Cent. Argentine ...	3,700	1.6.46	ps.3,116,100	—	ps.104,750	48	ps.151,574,106	ps.138,751,100	+	ps.12,823,006	"	9½	7	8
	Do.	—	—	—	—	—	—	—	—	—	Dfd.	5	2½	3½	
	Cent. Uruguay ...	970	1.6.46	39,567	—	3,154	48	1,908,903	1,693,717	+	215,186	Ord. Sk.	7½	4	7½
	Costa Rica ...	262	Apr., 1946	33,948	—	5,306	43	286,810	231,946	+	54,874	Stk.	16½	13	12½
	Dorada ...	70	Mar., 1946	26,161	—	2,061	13	85,975	82,705	+	3,270	1 Mt. Deb.	103	102	101½
	Entre Rios ...	808	1.6.46	ps.397,200	—	ps.33,400	48	ps.20,346,700	ps.19,125,500	+	ps.1,221,200	Ord. Sk.	7½	4½	5½
	G.W. of Brazil ...	1,030	1.6.46	23,400	—	4,000	22	637,300	563,300	+	74,000	Ord. Sk.	30½	23	24½
	Inter. Ctl. Amer. ...	794	Apr., 1946	\$963,780	—	\$135,112	17	\$3,878,475	\$3,109,079	+	\$769,396	—	—	—	—
	La Guaira ...	22½	May, 1946	5,889	—	1,518	18	28,227	29,823	—	1,596	5 p.c. Deb.	78	70	61½
	Leopoldina ...	1,918	1.6.46	52,972	—	1,051	22	1,216,976	996,549	+	220,427	Ord. Sk.	4½	3½	3½
	Mexican ...	483	31.5.46	ps.1,464,000	—	ps.459,100	21	ps.18,661,800	ps.13,441,600	+	ps.5,220,200	Ord. Sk.	—	—	—
	Midland Uruguay ...	319	Apr., 1946	16,340	—	2,535	40	180,630	175,706	+	4,924	Ord. Sh.	75½	67½	82½
	Nitrate ...	382	31.5.46	10,251	—	2,201	21	93,282	76,150	+	17,132	—	—	—	—
	N.W. of Uruguay ...	113	Apr., 1946	4,902	—	720	40	54,275	56,659	—	2,384	—	—	—	—
	Paraguay Cent. ...	274	31.5.46	53,085	—	66,988	48	62,911,379	62,906,259	—	5,120	Pr. Li. Stk.	79½	77	75½
	Peru Corp. ...	1,059	May, 1946	136,088	—	2,915	44	1,538,021	1,429,695	+	108,326	Pref.	10½	7½	16½
Salvador ...	100	Apr., 1946	c 138,700	—	c 10,300	40	c 1,393,700	c 1,308,000	+	c 85,700	—	—	—	—	
San Paulo ...	153½	—	—	—	—	—	—	—	—	—	Ord. Sk.	60½	50½	56½	
Talcal ...	156	Apr., 1946	5,180	—	2,270	44	33,200	26,280	+	6,920	Ord. Sh.	17½	10½	17½	
United of Havana ...	1,301	1.6.46	57,739	—	8,883	48	2,822,067	2,605,692	+	216,375	Ord. Sk.	3	1	1½	
Uruguay Northern ...	73	Apr., 1946	1,582	—	381	40	17,349	16,259	+	1,090	—	—	—	—	
Canada	Canadian National ...	23,569	Apr., 1946	6,282,200	—	868,200	17	24,754,000	27,319,000	—	2,565,000	—	—	—	—
	Canadian Pacific ...	17,037	31.5.46	1,493,600	—	300,000	21	23,259,800	25,331,000	—	2,071,200	Ord. Stk.	24	14½	23½
Various	Barsi Light† ...	202	Apr., 1946	33,000	—	5,812	4	33,000	27,188	+	5,812	Ord. Stk.	131	123	113½
	Beira ...	204	Mar., 1946	95,726	—	18,585	24	433,354	463,719	—	30,365	—	—	—	—
	Egyptian Delta ...	607	30.4.46	15,446	—	1,878	4	48,620	53,339	—	4,719	Pr. Sh.	10	8½	5½
	Manila ...	—	—	—	—	—	—	—	—	—	B. Deb.	71	55½	71½	
	Mid. of W. Australia...	277	Apr., 1946	19,664	—	3,191	40	172,148	189,748	—	17,600	Inc. Deb.	97½	85	75
	Nigeria ...	1,900	Mar., 1946	475,660	—	6,321	52	3,636,760	3,999,729	—	362,969	—	—	—	—
	Rhodesia ...	2,445	Mar., 1946	518,137	—	24,815	24	2,994,201	3,020,127	—	25,926	—	—	—	—
	South African ...	13,301	4.5.46	1,107,869	—	106,949	5	5,292,419	4,900,375	+	392,044	—	—	—	—
Victoria ...	4,774	Feb., 1946	1,234,862	—	18,137	—	—	—	—	—	—	—	—	—	

† Receipts are calculated @ 1s. 6d. to the rupee * Figures refer to Chilean section only. Bolivian figures not available on account of railway strike